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MONTHLY WEATHER REVIEW

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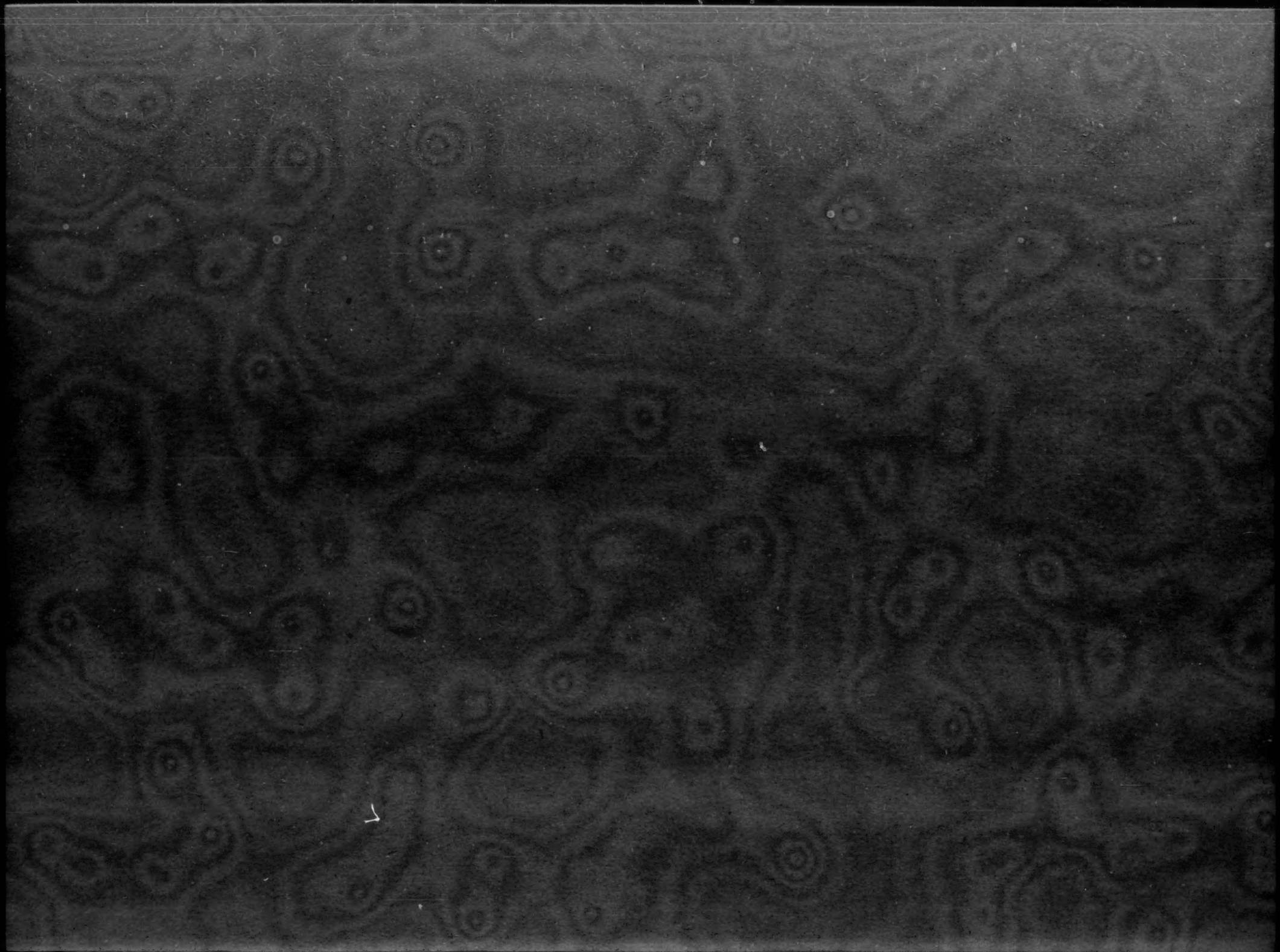

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THE NORTH ATLANTIC HURRICANE OF OCTOBER 13–21, 1944

*By H. C. SUMNER

[Weather Bureau, Washington, D. C., Dec. 1944]

THE hurricane of October 13–21, 1944, was of great intensity, and the most destructive storm to visit Cuba and Florida in recent years. Over 300 lives were lost as a result of the storm, and estimates of property damage run well over $100,000,000.

HISTORY OF THE HURRICANE

First indications that this tropical storm was developing in the Caribbean Sea came when the motorship *Silver Arrow*, en route from Jamaica to Belize, stopped at Swan Island about 6:30 p. m., on October 12, and reported rough seas encountered about 100 miles to the eastward. At this time the seas at Swan Island were already fairly high and conditions became gradually more severe until on the 16th the keeper of the island reported the roughest sea in his 17 years of residence. During the period of squally weather from the 12th to 18th, inclusive, no extremely high winds were recorded on the island, the highest gust failing to reach 60 miles per hour.

Farther to the northeastward at Grand Cayman Island, the first signs of the storm were noted during the forenoon of October 13, when a deck of low nimbostratus moved in obscuring the altostratus overcast that had made its appearance the previous day. Rain was continuous on Grand Cayman throughout the remainder of the day except for a 20-minute interval about 9:30 a. m., during which time it was possible to make a 2,000-foot pilot balloon run, showing upper air winds of 63 miles per hour, from a northeasterly direction. Surface winds averaged under 25 miles per hour, with gusts reaching 45 miles per hour, throughout the afternoon and evening on the 13th.

On the 14th surface winds had increased and the highest gust recorded was 58 miles per hour. On this day, as on all other days during the time that the storm influenced Grand Cayman, there was a definite rise in pressure after the normal diurnal minimum at about 4 a. m. and 4 p. m. At about 5 p. m. on the 14th rapidly changing conditions evidenced the existence of a heavy individual squall within the main storm area At that time the wind changed suddenly without pause from moderate NNE. to strong SE., and the heaviest rainfall of the entire storm period occurred. After about 20 minutes the wind returned to NNE. and lost much of its force. A record 24-hour rainfall for the island, 16.04 inches, fell on the 14th.

On the next day, October 15, shortly after 6:30 p. m., the pressure at Grand Cayman Island reached its lowest point 29.06 inches. The extreme gust for that station, 118 miles per hour from the east, was registered at about the same time. The hurricane center passed westward, south of the island and turned rather abruptly to the north along the 83d meridian. As the storm moved northward, hurricane winds on the right of the center sent a destructive storm tide lashing at docks, piers, and other shore installations on the south coast, reducing many of the wooden structures to kindling. During the late afternoon of the 17th the storm center crossed the Isle of Pines. Communications between Cuba and the smaller island were completely severed, but delayed reports that have filtered in indicate heavy damage on the Isle of Pines. Approaching Cuba from the south, the storm center crossed the island a short distance west of the Mariel-Majana line, the narrowest part of Cuba, and about 10 or 15 miles west of Havana.

On the 18th, at a point about midway between the north coast of Cuba and Dry Tortugas, a vessel heavily involved in the storm reported passing through the eye of the hurricane where calm airs were observed for an hour between 1:40 and 2:40 p. m. Except during passage through the center, hurricane winds (Beaufort force 12) were encountered from noon to about 4 p. m.

The calm center of the hurricane was observed over Dry Tortugas from 3 to 5 p. m. on the 18th. From that group of islands, the storm moved northward with the center passing inland south of Sarasota, near Nokomis, about 3 a. m. eastern standard time on October 19. A pressure of 28.42 inches (962.4 millibars) was recorded at Sarasota. Taking a course north-northeastward across Florida, the storm center skirted the east side of Tampa Bay, moved over Dade City and Ocala, and passed seaward a short distance below Jacksonville. Although the storm was traveling about 20 miles per hour, the "eye" was reported to have lasted from 11:30 a. m. to 5 p. m. This exceptionally long period of time required for conditions characteristic of the "eye" of the hurricane to pass Jacksonville indicates an unusually large central core. This central portion of the storm was apparently an elongated oval with its principal axis along the line of advance. The central core extended at one time almost from Jacksonville to Ocala, a distance of about 70 air line miles.

After traveling over a short expanse of ocean the center moved inland just north of Savannah. Passing some distance inland through South Carolina, North Carolina, and Virginia it again reached the Atlantic off the Eastern Shore of Maryland and moving northeastward with increasing speed, passed between Cape Cod and Nantucket, and reached Nova Scotia late on the 21st. Gale winds of force 8 were observed over Newfoundland on the following day during passage of the depression, which later merged with the Icelandic Low east of Greenland.

PRESSURE

The lowest pressure so far reported for the October hurricane is 28.02 inches (948.9 millibars) recorded by an aneroid barometer (uncorrected) at Dry Tortugas on the 18th of October. Within the continental limits of

the United States the lowest known pressure was 28.42 inches (962.4 millibars) registered at Sarasota, Fla., during the late afternoon of the 19th. A reading of 28.55 inches (966.8 millibars) taken at Tampa is the lowest recorded at that station in the period of more than 50 years of record. The lowest sea-level pressure on record in the western hemisphere is 26.35 inches, recorded in the Florida Keys storm of September 2, 1935.

A tabular listing of the lowest pressures observed at selected stations during the October hurricane is contained in table 1.

WINDS

Damaging winds accompanied the hurricane from the time the storm took up a position west of Grand Cayman Island, British West Indies, on the 16th, until the center had passed north of Savannah, Ga., and into southern South Carolina, late on the 19th. During passage of the storm over Florida, gale winds were experienced over the entire peninsula and westward over the Gulf Coast nearly to Tallahassee, as well as over the coastal sections of Georgia and South Carolina.

The highest winds recorded during the passage of the hurricane were recorded at Havana (National Observatory), across the bay from the city, where the fastest mile registered 120 miles per hour and the strongest gust 163 miles from the south-southeast at about 10 a. m. on October 18. Gusts of at least 60 miles per hour were recorded for a period of 18 hours, and for 1¼ hours all gusts were above 140 miles per hour.

At Dry Tortugas the wind record on a special airways type of anemometer registered 120 miles per hour for 2 consecutive hours before the instrument was finally blown away.

Tampa, although registering the lowest pressure in the history of the station, did not suffer the damage that might be expected, as the storm center passed a short distance to the right of the city and at the height of the storm the winds were blowing offshore.

Heaviest wind damage occurred over a 30-mile-wide belt, beginning on the right-hand edge of the central core which, over Florida, extended some 20 miles on each side of the storm track. Damaging winds thus cut a wide swath through the great citrus and truck producing areas of the State. Orlando reported a 1-minute maximum velocity of 82 miles per hour and gusts of 108 miles per hour, from the south-southeast, during the morning of the 19th.

Stations in the following tabular summary of meteorological conditions accompanying the 1944 hurricane are arranged in a time sequence corresponding, as nearly as possible, to the order in which they were affected by the storm.

TABLE 1.—*Meteorological data for hurricane of Oct. 13–21, 1944*

[All times eastern standard]

Station	Date of observation	Lowest pressure	Time of lowest pressure	Velocity and direction at time of lowest pressure	Maximum wind velocity and direction for a 5-minute period	Time of maximum velocity	Extreme wind velocity and direction (fastest mile from register)	Time of extreme velocity	Velocity of extreme gust	Duration in hours of winds over 38 miles per hour
Swan Island, West Indies					38 NW		40		58	
Grand Cayman, British West Indies	15	29.06	5:30 p. m.	55 E	95				118 E	
Havana, Cuba:										
National Observatory	18	28.50					140	10:00 a. m.	163 SSE	
Batista Field	18	28.36	7:00 a. m.	80 SSE			85 SE [1]	5:45 a. m.	125	17
Dry Tortugas	18	[3] 28.02	5:00 p. m.		120 E [4]	1–2:00 p. m.	120 E [1]	1–2:00 p. m.		72
Key West, Fla	18	29.11	2:50 p. m.	38 SE	56 SE	2:37 p. m.	66 SE	2:11 p. m.		13
Sombrero Light	18	29.25	4:00 p. m.	110 SE	115 SE	6–7:00 p. m.				30
Miami, Fla	19	29.49	1:57 a. m.		65	12:03 a. m.	69	12:04 a. m.		
Sanibel Light	19	28.98	12:30 a. m.	100 S	100 S	12:30 a. m.				13
Fort Myers, Fla	19	29.05	12:30 a. m.	65 ESE	65	12:30 a. m.				17
Tampa, Fla	19	[5] 28.55	5:00 a. m.	43 NE	56 NE	4:19 a. m.	68 NE	4:23 a. m.	100 [2]	5
Lakeland, Fla. (WBO)	19	28.68	5:30 a. m.	45 E	49 E	4:35 a. m.	57 E [1]	4:38 a. m.		3
Lakeland, Fla. (WBAS)	19	28.67	5:30 a. m.				57 E [1]	4:30 a. m.	78	
Lakeland, Fla. (Army)	19	28.62					81 E [1]		86	
Orlando, Fla	19	28.94	7:30 a. m.	62 ESE			82 SSE [1]	9:05 a. m.	108 SSE	
Jacksonville, Fla	19	28.94	2:44 p. m.	6 SE	41 NE	8:02 a. m.	46 NE	7:45 a. m.	60	1½
Savannah, Ga	19	29.13	11:55 p. m.	15 NW	42		50 NE [2]	5:05 p. m.	85 [2]	
Charleston, S. C	20	29.25	2:30 a. m.	40 S [3]	60 NE [3]	7:15 p. m.			70 [2]	4½
Florence, S. C	20	29.36	6:28 a. m.	25 SE					75	2
Columbia, S. C	20	29.28	7:00 a. m.	19 NNE	30 NE	7:34 p. m.	34 NE	7:34 p. m.	60 NNE	0
Wilmington, N. C	20				37 S	10:47 a. m.	40 S	10:52 a. m.	52 [2]	0
Greensboro, N. C	20	29.53	1:30 p. m.	20 N	35 NE	5:28 a. m.	38 NE	5:30 a. m.	61	0
Raleigh, N. C	20	29.60	3:00 p. m.	18 SW	29 S	1:42 p. m.	31 S	1:44 p. m.	60	0
Richmond, Va	20	29.49	7:15 p. m.	10 W	24 NE	9:25 a. m.	25 NE	9:25 a. m.	25 NE	0
Extreme pressure and highest velocities		[5] 28.02			120 E [4]		140		163 SSE	72

[1] Maximum for 1 minute.
[2] Estimated.
[3] Aneroid barometer (uncorrected).
[4] Anemometer blown down by wind registering 120 miles per hour.
[5] Exceeds all previous records.

STORM TIDES

On the continent, damage from high tides was most severe along the Florida west coast, between Sarasota and Everglades, with heaviest losses reported along the beaches near Fort Myers. Along the coast north of Sarasota, including Tampa Bay, offshore winds prevented serious tide damage.

The highest tide reported was 12.28 feet above mean low tide at Jacksonville Beach, in an area which was subjected to a tide built up by gale winds off the ocean.

In Cuba, along the southern coast of Havana Province, a tidal wave caused the death of 20 persons in 1 small village and resulted in a considerable property damage. Its strength can be gaged by a report, received through the State Department, that a Standard Oil barge was carried 10 miles inland.

TABLE 2.—*Storm tides during the hurricane of October 1944*

Station	Highest tide [1]	Date	Time of highest tide (est.)	Normal high tide [2]	Time of normal highest tide (est.) [2]
	Feet				
Key West, Fla.	3.0	18	4:30 p. m.	[3] 0.5	4:02 p. m.
Everglades, Fla.	8.2	19	4:00 a. m.	2.6	1:18 a. m.
Fort Myers, Fla.	4.5	19	3:00 a. m.		
Tampa, Fla.	3.1	19	2:15 p. m.	1.9	4:08 p. m.
Daytona Beach, Fla.	6.9	19	9:00 a. m.	4.8	9:03 a. m.
Jacksonville Beach, Fla.	12.28	19	9–10:00 a. m.		
Jacksonville, Fla.	4.5	19	9–10:00 a. m.		
Fernandina, Fla.	10.6	19	11:18 a. m.	6.6	9:45 a. m.
Mayport, Fla.	7.83	19		5.3	9:33 a. m.
Savannah, Ga.	9.4	19	11:00 a. m.	8.3	9:40 a. m.
Charleston, S. C.	8.5	19	8:24 p. m.	5.1	9:02 p. m.

[1] Height above mean low tide.
[2] Compiled by Coast and Geodetic Survey.
[3] Low tide; high tide 1.6 at 10:44 a. m.

WARNINGS AND ADVISORIES

During the 9 days that the hurricane menaced the islands and the Atlantic Seaboard of the United States, a total of 58 warnings and advisories were issued by the Hurricane Warning Centers at Miami, Washington, and Boston. At Miami on the 18th and 19th, prior to the failure of all wire service, 6 commercial radio stations maintained microphones in the Weather Bureau Office over which broadcasts of all warnings and advices were made at 2- to 3-hour intervals by members of the station force. Thorough and prompt dissemination of warnings by all news distributing agencies resulted in the evacuation of thousands of persons from threatened areas, and safeguarding, insofar as was possible, of all protectable property.

The Red Cross reports sheltering 35,000 persons during the height of the storm, a figure which represents only a small proportion of those evacuated from danger areas in the storm's path.

All Army and Navy planes that were in flying condition were moved from Florida to safe fields, and personnel that was not considered essential was evacuated from threatened sections. At Key West 150 small naval vessels were so effectively secured that no vessels were lost and only 6 grounded or had to be beached. Salvage of these was effected without great expense.

LOSS OF LIFE

The number of deaths resulting from the October hurricane has been placed at 318. This number will probably be increased as additional reports are received from the rural areas of Cuba, and the islands to the south, where most of the fatalities occurred.

Marine casualties include nine persons killed and five injured. The deaths occurred in the capsizing of a boat which was attempting to ride out the storm while at anchor in the mouth of Tampa Bay. The injured were involved in the sinking of a crash boat from Batista air base.

PROPERTY DAMAGE

Property damage incurred in connection with the storm has been placed at over $100,000,000, of which $63,000,000 has been estimated for the State of Florida.

As a result of the hurricane taking a path through the great citrus- and truck-producing area of the State, damage to crops was excessive. A total of about 25,000,000 boxes of fruit was blown from the trees or otherwise damaged. Only a small percentage of this fruit could be salvaged. Damage to fall truck is estimated at 70 to 75 percent of the crop.

Damage summary for Florida

Crops	$50, 000, 000
Buildings (including livestock)	8, 000, 000
Power and communications	800, 000
Highways and bridges	200, 000
Trees, ornamentals and shrubbery	3, 000, 000
Miscellaneous	1, 000, 000
Total damage	63, 000, 000

Damage in North Carolina and South Carolina was largely confined to power and communication lines, and from flooding of low coastal areas by high tides. Similar damage occurred in Georgia, and in addition many small fishing boats were wrecked in Savannah harbor.

In Cuba damage was reported from the Provinces of Havana, Pinar del Rio, and Matanzas, but was most severe in the eastern and northern portions of Pinar del Rio, in the region of Guanajay, Artemisa, and Candelaria. After passage of the hurricane, Havana harbor was so clogged with wrecked and sunken vessels that it was closed to traffic until it could be cleared. Reports of property damage in the island areas are too sporadic, at this time, to warrant statistical summarization.

TABLE 3.—*Data on hurricane of Oct. 13–21, 1944*

Place where first reported	Latitude 17° to 18° N., longitude 81°W., or about 200 miles east of Swan Island.
Coast lines crossed	Cuba, Florida, Georgia, Virginia, Maryland, and Delaware.
Lowest barometer reported at land station.	948.9 millibars (28.02 inches) at Dry Tortugas.
Lowest barometer reported at sea.	963.8 millibars (28.46 inches) at 4:30 p. m. on the 18th, near latitude 23°52′ N., longitude 83°01′N
Maximum wind velocity and direction for a 5-minute period.	120 miles per hour from the East at Dry Tortugas.[1]
Maximum wind velocity and direction for a 1-minute period.	140 miles per hour at Havana, Cuba.
Velocity of extreme gust	163 miles per hour from the South-southwest at Havana, Cuba.
Greatest duration of gale winds.	72 hours of winds over 38 miles per hour at Dry Tortugas.
Heaviest precipitation	31.29 inches of rain fell during the passage of the hurricane at Grand Cayman Island, British West Indies, with a 24-hour maximum of 16.04 inches.
Number of persons killed	18 persons killed in Florida. An estimated 300 lives lost in the Cuba area, about 200 of which were reported on the Isle of Pines and 24 at Havana.
Property damage	Estimated over $100,000,000 in the Florida and Cuba areas, of which about $63,000,000 occurred in Florida.

[1] Anemometer blown down by wind registering 120 miles per hour.

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR NOVEMBER 1944

[Climate and Crop Weather Division, W. A. Mattice, Acting in charge]

AEROLOGICAL OBSERVATIONS

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during November 1944*

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m. s. l.	Albany, N. Y. (86 m.)				Albuquerque, N. Mex. (1,620 m.)				Apalachicola, Fla. (5 m.)				Atlanta, Ga. (300 m.)				Big Spring, Tex. (774 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (868 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	30	1,006	3.0	80	30	837	6.1	50	29	1,018	15.6	83	30	984	9.0	72	29	928	11.2	63	29	957	−3.9	89	29	917	4.1	75
500	30	956	1.9	77					29	960	15.2	65	30	961	10.1	66												
1,000	30	898	−0.1	75					29	905	12.6	59	30	905	8.1	65	29	903	12.0	57	29	899	−2.8	84	29	902	4.2	71
1,500	30	844	−1.3	70					29	853	11.1	51	30	852	6.9	56	29	851	9.9	52	29	844	−1.4	72	29	848	1.8	68
2,000	30	792	−2.3	63	30	799	5.2	49	29	803	9.3	45	30	801	6.2	46	29	801	7.6	49	29	792	−1.4	57	29	797	−1.2	72
2,500	30	744	−4.2	58	30	751	1.9	51	29	756	7.1	41	30	754	4.1	43	29	753	4.8	49	29	744	−2.6	50	29	748	−3.3	68
3,000	30	698	−6.8	57	30	706	−0.9	51	29	711	4.5	42	29	708	1.6	36	29	708	1.7	46	29	698	−5.1	52	29	703	−5.6	60
4,000	30	613	−11.7	48	30	622	−7.4	57	29	628	−0.5	----	28	628	−3.6	31	29	625	−4.0	----	29	614	−10.6	51	29	618	−10.8	61
5,000	29	538	−17.5	----	30	546	−13.6	42	27	554	−6.4	----	27	550	−9.6	----	29	550	−10.0	----	29	539	−16.7	52	28	542	−17.1	56
6,000	28	470	−24.6	----	30	478	−20.2	----	26	486	−13.0	----	27	482	−15.8	----	29	482	−16.5	----	29	471	−23.7	56	27	474	−23.4	----
7,000	28	409	−31.7	----	30	417	−27.3	----	26	426	−19.9	----	24	422	−23.0	----	28	421	−23.4	----	29	410	−31.0	58	27	412	−30.1	----
8,000	28	354	−39.1	----	30	362	−34.7	----	26	371	−27.5	----	22	367	−30.1	----	28	367	−30.5	----	29	354	−39.2	----	23	358	−36.8	----
9,000	28	305	−46.2	----	29	313	−41.5	----	26	322	−34.8	----	18	319	−37.4	----	28	318	−37.8	----	29	305	−47.0	----	21	309	−44.0	----
10,000	28	262	−52.3	----	28	270	−47.9	----	26	278	−42.1	----	16	277	−44.3	----	27	274	−45.1	----	27	262	−54.0	----	15	266	−51.1	----
11,000	27	225	−56.4	----	28	231	−53.1	----	22	240	−49.5	----	12	237	−51.3	----	23	236	−51.6	----	20	225	−59.1	----	8	228	−58.0	----
12,000	20	191	−57.7	----	22	198	−56.7	----	17	206	−55.8	----	9	205	−56.3	----	17	202	−57.6	----	12	192	−61.9	----				
13,000	17	163	−57.1	----	13	170	−56.3	----	11	176	−60.7	----	5	177	−60.4	----	10	173	−62.2	----								
14,000	13	139	−57.5	----	6	144	−57.5	----	6	149	−62.7	----					6	147	−64.0	----								
15,000	7	119	−58.9	----													5	122	−67.2	----								

Altitude (meters) m. s. l.	Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Caribou, Maine (193 m.)				Charleston, S. C. (14 m.)				Denver, Colo. (1,616 m.)				Dodge City, Kans. (787 m.)				El Paso, Tex. (1,195 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	30	1,016	18.7	85	30	990	4.9	77	29	993	0.5	86	30	1,017	10.1	86	30	836	2.1	55	30	924	5.4	74	29	882	10.7	56
500	30	959	17.3	80	30	956	3.7	74	29	956	−0.4	85	30	959	11.7	67												
1,000	30	905	15.2	73	30	899	1.4	74	29	898	−1.6	78	30	904	8.8	65					30	901	6.7	64				
1,500	30	853	12.9	72	30	845	−0.5	68	29	844	−2.6	69	30	851	6.9	56					30	847	5.2	55	29	851	11.2	49
2,000	30	803	11.1	64	30	793	−2.8	68	29	791	−3.9	61	30	800	5.8	46	30	797	4.7	44	30	796	3.0	51	29	801	8.2	49
2,500	30	757	9.4	56	30	745	−5.2	67	29	743	−5.5	52	30	752	4.0	39	30	749	2.0	43	30	748	0.8	45	29	753	5.1	49
3,000	30	712	7.0	52	30	698	−7.5	66	29	697	−7.5	51	30	707	1.4	39	30	704	−1.6	47	30	703	−1.7	45	29	708	1.9	49
4,000	30	630	0.3	51	28	613	−12.7	57	29	612	−13.0	48	30	624	−4.0	34	30	620	−8.5	53	30	619	−7.9	40	29	625	−4.0	43
5,000	30	555	−5.6	41	28	537	−18.3	----	29	536	−19.5	51	28	549	−10.2	34	30	544	−15.3	57	30	544	−14.5	----	29	550	−10.5	----
6,000	28	488	−12.0	----	28	469	−25.4	----	29	468	−26.1	49	28	481	−16.9	41	29	476	−22.5	51	30	476	−21.4	----	29	482	−17.2	----
7,000	26	428	−19.2	----	28	408	−32.8	----	29	406	−33.2	----	27	421	−23.5	----	29	414	−29.9	----	30	414	−28.7	----	28	422	−23.8	----
8,000	25	373	−26.4	----	28	353	−39.7	----	28	352	−40.6	----	27	366	−31.0	----	29	359	−37.8	----	28	359	−36.2	----	28	367	−31.2	----
9,000	23	324	−33.7	----	28	304	−45.8	----	28	303	−48.2	----	25	317	−38.6	----	27	310	−44.9	----	28	310	−43.6	----	27	318	−38.5	----
10,000	22	281	−41.0	----	26	261	−50.3	----	26	260	−54.2	----	22	274	−46.1	----	19	267	−50.5	----	27	267	−50.3	----	27	274	−45.3	----
11,000	21	241	−48.7	----	22	224	−53.5	----	23	223	−57.0	----	17	235	−53.4	----	15	229	−54.3	----	24	229	−55.2	----	26	236	−51.8	----
12,000	18	207	−55.5	----	17	192	−55.2	----	14	190	−56.9	----	10	202	−58.3	----	14	195	−58.1	----	16	196	−57.3	----	21	202	−56.7	----
13,000	9	177	−61.2	----	11	163	−55.9	----	9	162	−57.0	----	7	172	−60.1	----	8	165	−57.3	----	8	166	−57.2	----	15	172	−60.2	----
14,000					5	140	−55.9	----																	10	147	−62.6	----
15,000																									5	125	−64.5	----

Altitude (meters) m. s. l.	Ely, Nev. (1,908 m.)				Glasgow, Mont. (648 m.)				Grand Junction, Colo. (1,416 m.)				Great Falls, Mont. (1,128 m.)				Greensboro, N. C. (273 m.)				Hatteras, N. C. (3 m.)				Huntington, W. Va. (172 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	30	808	−1.0	81	30	941	−3.3	85	29	859	4.6	63	29	885	1.0	69	30	986	6.1	80	27	1017	11.2	82	30	999	4.7	83
500																	30	959	7.5	71	27	958	9.9	71	30	960	5.8	77
1,000					30	900	−2.7	79									30	903	4.8	72	27	902	7.1	68	30	902	3.6	76
1,500					30	846	−1.4	62	29	850	5.0	59	29	845	1.8	61	30	849	2.6	68	27	849	4.6	67	30	848	1.7	73
2,000	30	798	−0.7	78	30	793	−2.2	57	29	799	3.0	53	29	794	0.0	57	30	798	1.2	60	27	798	2.9	59	30	797	−0.2	67
2,500	30	750	−1.7	70	30	745	−4.0	55	28	851	−0.1	59	29	746	−2.4	55	30	750	−0.3	50	27	750	0.6	54	30	748	−1.9	61
3,000	30	704	−4.1	67	30	699	−6.2	52	28	706	−3.5	61	29	700	−5.0	55	30	704	−2.4	43	27	704	−1.1	44	30	703	−3.8	55
4,000	30	620	−9.1	53	30	614	−11.2	52	28	621	−9.6	64	29	616	−10.8	52	29	620	−7.5	----	24	621	−6.4	----	30	618	−8.9	46
5,000	30	544	−15.2	44	29	539	−17.5	58	28	545	−15.9	61	29	540	−17.3	58	29	545	−13.7	----	21	546	−12.4	----	29	543	−14.5	36
6,000	30	476	−22.2	48	28	470	−24.5	58	28	476	−22.6	57	28	472	−24.3	60	29	477	−20.4	----	18	480	−17.1	----	29	475	−21.1	----
7,000	30	414	−29.6	48	27	410	−31.7	57	27	414	−30.3	----	26	410	−31.8	----	29	416	−27.0	----	17	420	−24.5	----	28	414	−28.4	----
8,000	29	359	−37.3	----	27	354	−39.5	----	27	358	−37.7	----	25	356	−38.8	----	27	361	−34.2	----	12	366	−31.8	----	27	359	−35.2	----
9,000	29	310	−44.6	----	27	305	−47.5	----	26	309	−45.0	----	25	306	−46.2	----	25	313	−41.2	----	11	317	−39.7	----	27	310	−41.7	----
10,000	29	266	−51.3	----	27	262	−54.7	----	24	266	−50.4	----	25	263	−53.3	----	21	269	−48.3	----	9	274	−47.2	----	26	268	−47.9	----
11,000	26	228	−56.4	----	23	225	−59.3	----	21	228	−54.1	----	22	225	−58.5	----	18	232	−54.6	----	9	235	−55.1	----	24	230	−53.1	----
12,000	19	195	−58.9	----	15	191	−59.5	----	8	192	−53.2	----	17	192	−60.7	----	14	199	−60.3	----	8	201	−60.9	----	19	197	−57.1	----
13,000	14	166	−59.2	----	6	162	−58.2	----					9	162	−60.0	----	9	170	−61.3	----	5	170	−65.1	----	14	168	−60.5	----
14,000	8	141	−56.5	----									6	138	−59.5	----									7	143	−59.0	----
15,000																												

See footnotes at end of table.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during November 1944*—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

	Int'l Falls, Minn. (343 m.)				Jackson, Miss. (97 m.)				Joliet, Ill. (178 m.)				Lake Charles, La. (5 m.)				Lakehurst, N. J.[1] (39 m.)				Little Rock, Ark. (79 m.)				Louisville, Ky. (165 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	30	976	−0.6	86	30	1,007	11.7	77	30	996	4.7	86	30	1,018	14.7	85	25	1,013	5.0	78	30	1,009	10.4	75	30	999	6.9	73
500	30	957	−1.2	86	30	959	12.5	68	30	957	3.9	82	30	960	14.8	72	25	957	4.6	70	30	959	10.6	66	30	959	6.3	70
1,000	30	899	−4.0	87	30	904	10.5	67	30	900	1.6	83	30	905	12.7	68	25	900	2.9	68	30	904	8.0	68	30	902	3.5	72
1,500	30	844	−3.6	81	30	852	9.0	61	30	846	0.3	74	30	853	10.7	63	25	846	0.8	65	30	851	6.4	64	30	849	1.4	72
2,000	30	792	−4.4	67	30	801	7.2	51	30	794	−1.0	64	30	803	9.1	55	25	795	−1.3	61	30	800	5.1	56	30	797	1.0	58
2,500	30	743	−5.7	63	30	754	5.0	47	30	746	−2.8	55	30	756	7.0	52	25	746	−3.7	58	30	752	3.4	49	30	749	−0.6	53
3,000	30	697	−8.1	61	30	709	2.5	43	30	700	−4.7	47	29	711	4.8	48	25	700	−6.1	53	29	707	0.9	42	30	703	−3.2	50
4,000	29	612	−13.3	57	29	626	−2.7	45	30	616	−10.8	47	29	628	−0.4	42	24	615	−11.5	----	29	624	−4.4	37	30	619	−8.3	39
5,000	28	536	−18.8	----	28	551	−8.5	----	30	540	−16.7	----	28	554	−6.3	----	24	540	−17.7	----	29	549	−10.5	----	30	544	−14.4	----
6,000	28	468	−25.7	----	27	483	−15.4	----	30	472	−23.1	----	28	487	−12.9	----	23	471	−24.5	----	29	481	−17.1	----	30	476	−21.3	----
7,000	26	407	−32.4	----	27	423	−22.5	----	30	411	−30.1	----	28	426	−20.0	----	20	410	−31.9	----	29	420	−24.0	----	29	415	−27.8	----
8,000	26	352	−39.8	----	27	368	−29.9	----	29	356	−37.1	----	27	371	−27.2	----	15	352	−39.7	----	29	366	−31.2	----	29	360	−34.9	----
9,000	26	304	−46.7	----	27	319	−37.5	----	29	308	−43.9	----	27	322	−34.6	----	13	305	−45.3	----	28	316	−38.7	----	27	312	−41.7	----
10,000	25	261	−53.1	----	27	276	−45.3	----	28	265	−49.8	----	27	279	−41.9	----	13	262	−50.1	----	27	274	−45.9	----	28	269	−48.7	----
11,000	24	223	−57.5	----	26	236	−52.6	----	26	227	−54.4	----	26	240	−49.2	----	12	226	−53.5	----	27	235	−53.0	----	22	230	−54.4	----
12,000	20	190	−58.4	----	23	202	−58.4	----	22	195	−57.3	----	24	206	−55.8	----	6	193	−53.9	----	23	201	−58.8	----	17	198	−58.8	----
13,000	13	162	−56.8	----	21	172	−62.7	----	14	166	−56.5	----	18	176	−60.5	----	----	----	----	----	17	170	−60.8	----	10	168	−60.5	----
14,000	9	137	−57.1	----	14	146	−64.3	----	9	140	−55.9	----	14	149	−63.4	----	----	----	----	----	11	144	−61.2	----	----	----	----	----
15,000	----	----	----	----	----	----	----	----	----	----	----	----	8	126	−66.4	----	----	----	----	----	9	123	−61.9	----	----	----	----	----
16,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	7	104	−63.9	----	----	----	----	----
17,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6	88	−65.8	----	----	----	----	----
18,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	75	−64.8	----	----	----	----	----

	Mazatlan, Mexico (80 m.)				Medford, Oreg. (409 m.)				Merida, Mexico (27 m.)				Miami, Fla. (4 m.)				Nashville, Tenn. (180 m.)				Norfolk, Va.[1] (4 m.)				Oakland, Calif. (2 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	20	1,005	22.7	76	30	967	6.1	85	30	1,013	24.0	78	30	1,018	17.9	85	29	998	8.3	73	28	1,017	10.7	74	30	1,016	12.0	78
500	20	958	21.6	63	30	957	6.6	82	30	959	22.2	74	30	961	17.7	75	29	960	7.7	70	28	958	8.1	67	30	957	10.3	73
1,000	20	904	19.1	58	30	900	5.8	69	30	906	19.3	74	30	906	14.5	74	29	903	4.7	73	28	902	5.6	64	30	901	7.6	69
1,500	20	853	16.3	46	30	847	3.3	70	30	854	15.7	76	30	854	12.3	60	29	850	3.7	63	28	848	3.7	58	30	848	5.1	63
2,000	20	804	13.4	42	30	796	0.8	67	30	805	13.9	61	30	804	11.3	43	29	798	2.8	53	26	797	1.5	61	30	797	2.5	58
2,500	20	757	10.5	38	30	748	−1.7	62	30	758	11.9	47	30	757	9.4	38	29	750	1.3	44	25	748	−0.6	58	30	749	−0.2	52
3,000	20	713	7.7	----	29	702	−4.2	54	30	714	9.7	35	30	713	6.9	37	29	705	−0.7	38	23	703	−2.7	----	30	704	−2.5	48
4,000	19	631	1.3	----	28	618	−9.8	51	30	633	4.5	----	30	630	1.5	30	27	622	−6.2	----	23	619	−7.4	----	30	620	−7.8	39
5,000	19	556	−4.7	----	28	542	−16.0	48	30	559	−1.6	----	29	556	−4.3	----	26	546	−12.7	----	22	544	−13.4	----	30	544	−13.6	40
6,000	19	489	−11.4	----	28	474	−22.8	51	30	492	−7.7	----	29	489	−10.6	----	26	478	−19.1	----	22	476	−20.0	----	30	476	−20.5	46
7,000	19	428	−18.9	----	27	412	−30.3	----	29	432	−14.6	----	29	429	−17.6	----	25	417	−26.2	----	22	415	−27.5	----	30	415	−27.9	44
8,000	16	374	−26.4	----	26	357	−37.9	----	28	377	−22.6	----	29	374	−24.9	----	20	364	−32.6	----	16	361	−33.8	----	30	360	−35.4	----
9,000	16	324	−34.0	----	25	308	−44.9	----	28	328	−30.4	----	29	325	−32.3	----	20	315	−39.7	----	15	312	−40.1	----	29	312	−42.4	----
10,000	16	281	−41.6	----	23	265	−50.6	----	28	285	−38.5	----	29	282	−39.9	----	20	272	−47.0	----	14	269	−46.2	----	28	268	−49.0	----
11,000	13	242	−49.3	----	21	228	−56.0	----	26	246	−46.3	----	26	243	−47.7	----	19	233	−53.8	----	14	231	−52.2	----	27	231	−54.2	----
12,000	12	206	−57.2	----	12	195	−60.1	----	23	211	−54.3	----	25	208	−54.7	----	15	200	−58.5	----	10	197	−58.5	----	18	197	−57.6	----
13,000	7	176	−60.8	----	6	164	−58.4	----	18	180	−61.0	----	22	178	−60.5	----	7	171	−60.4	----	10	167	−61.7	----	13	168	−59.9	----
14,000	----	----	----	----	----	----	----	----	11	153	−67.0	----	16	151	−64.8	----	5	145	−62.6	----	5	142	−60.2	----	8	143	−59.2	----
15,000	----	----	----	----	----	----	----	----	8	130	−71.4	----	5	129	−67.9	----	----	----	----	----	5	121	−60.9	----	----	----	----	----

	Ogden, Utah (1,355 m.)				Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (308 m.)				Pensacola, Fla.[1] (24 m.)				Phoenix, Ariz. (339 m.)				Pittsburgh, Pa. (392 m.)				Portland, Maine (20 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	30	865	2.0	79	28	971	9.4	77	28	980	4.1	79	17	1,017	17.1	----	30	975	12.2	72	30	972	4.9	81	30	1,013	2.0	87
500	----	----	----	----	28	958	10.5	71	28	957	3.5	79	17	961	14.8	----	30	956	14.7	57	30	958	4.7	80	30	955	2.2	81
1,000	----	----	----	----	28	902	8.8	63	28	900	1.7	78	17	906	12.5	----	30	901	12.5	51	30	901	2.8	78	30	897	−0.1	81
1,500	30	849	2.7	71	28	850	6.2	61	28	846	1.1	69	17	854	10.5	----	30	849	8.7	54	30	847	0.4	76	30	843	−1.4	74
2,000	30	798	0.0	66	28	798	4.4	55	28	794	−0.4	62	17	803	8.0	----	30	798	5.1	52	30	795	−1.5	72	30	791	−2.4	64
2,500	30	749	−2.4	66	28	751	2.4	49	28	746	−2.1	55	17	756	6.0	----	30	751	1.9	51	29	746	−4.1	69	30	743	−3.9	58
3,000	30	704	−5.1	62	28	706	0.5	40	28	700	−4.6	55	17	711	3.5	----	30	706	−1.0	47	29	701	−6.1	62	30	697	−6.4	55
4,000	30	619	−10.8	61	26	622	−5.6	42	28	616	−9.8	50	17	628	−1.7	----	30	622	−6.8	46	29	616	−10.6	50	30	613	−11.5	50
5,000	30	542	−17.4	60	25	547	−11.4	----	28	541	−16.1	----	15	553	−8.1	----	30	546	−12.9	44	29	540	−16.0	----	29	537	−17.6	50
6,000	30	474	−24.3	64	25	480	−18.4	----	28	473	−22.8	----	15	485	−14.9	----	29	478	−19.9	42	28	472	−23.1	----	27	469	−24.5	50
7,000	30	412	−31.3	----	25	418	−25.3	----	28	412	−30.0	----	15	424	−22.3	----	29	417	−27.4	42	26	412	−29.5	----	27	408	−31.8	51
8,000	30	357	−38.7	----	25	364	−32.3	----	27	357	−37.1	----	12	369	−30.0	----	29	361	−35.2	----	24	356	−36.3	----	26	353	−39.6	----
9,000	30	308	−46.3	----	24	315	−39.3	----	25	309	−44.2	----	12	320	−37.5	----	28	312	−41.7	----	24	308	−42.9	----	26	304	−46.8	----
10,000	29	264	−52.7	----	24	272	−46.1	----	20	267	−49.7	----	11	276	−45.0	----	27	269	−47.8	----	23	265	−49.0	----	25	261	−52.3	----
11,000	28	227	−57.4	----	23	234	−52.6	----	17	229	−54.7	----	7	239	−51.4	----	26	231	−53.1	----	22	228	−53.6	----	24	224	−54.7	----
12,000	22	193	−58.7	----	18	200	−58.7	----	10	195	−56.4	----	6	205	−57.5	----	22	198	−56.6	----	17	195	−57.5	----	21	191	−55.6	----
13,000	18	164	−59.2	----	11	171	−62.3	----	8	166	−57.4	----	5	174	−62.1	----	14	169	−58.8	----	11	166	−58.4	----	17	163	−54.9	----
14,000	12	140	−58.6	----	6	144	−62.1	----	----	----	----	----	----	----	----	----	5	145	−64.1	----	7	141	−58.2	----	6	138	−56.1	----
15,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

See footnotes at end of table.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during November 1944*—Continued

	Rapid City, S. Dak. (981 m.)				St. Louis, Mo. (171 m.)				St. Paul, Minn. (225 m.)				San Antonio, Tex. (240 m.)				San Diego, Calif.[1] (19 m.)				San Juan, P. R. (15 m.)				Santa Maria, Calif. (71 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	28	903	−0.4	79	30	998	7.4	74	30	989	3.2	83	30	990	14.1	81	28	1,014	15.1	78	27	1,011	24.7	81	30	1,008	11.3	89
500					30	959	5.7	76	30	956	1.3	84	30	960	14.5	73	28	958	12.7	74	27	957	21.5	79	30	957	11.8	67
1,000	28	900	−0.2	80	30	902	3.7	76	30	898	−1.1	87	30	904	12.3	71	28	902	10.4	65	27	903	18.0	79	30	902	9.2	62
1,500	28	847	+1.1	63	30	848	2.2	71	30	844	−2.3	82	30	852	10.4	64	28	849	7.6	57	27	852	15.3	73	30	849	6.4	58
2,000	28	795	+1.0	47	30	797	0.7	65	30	792	−2.9	72	30	802	8.8	55	28	799	5.3	53	27	803	13.0	67	30	798	3.9	51
2,500	28	747	−1.4	47	30	749	−0.5	52	30	744	−4.4	64	30	755	6.9	45	28	751	2.9	43	27	757	10.8	61	30	750	1.5	45
3,000	28	701	−4.2	49	30	703	−2.8	48	30	698	−6.6	55	30	710	4.5	35	28	706	0.4	40	27	712	8.5	50	30	705	−1.2	43
4,000	28	617	−10.1	50	30	619	−8.5	45	27	613	−12.4	49	30	628	−1.0		28	623	−5.2	37	27	630	3.2	40	30	621	−6.9	34
5,000	28	541	−16.6	48	29	543	−14.7	42	27	537	−18.5		29	553	−7.2		28	547	−11.5		27	556	−2.7		30	546	−13.0	
6,000	27	473	−23.5	50	29	475	−21.3		27	469	−25.2		29	486	−13.9		28	479	−18.7		26	490	−8.8		30	477	−19.9	
7,000	26	411	−31.0		29	414	−28.3		26	408	−32.3		29	425	−20.9		28	418	−26.9		26	430	−15.3		30	416	−27.5	
8,000	26	356	−38.3		28	359	−35.2		26	353	−39.9		29	370	−28.2		25	363	−34.4		24	376	−22.2		30	361	−34.9	
9,000	26	307	−45.9		28	310	−41.9		26	304	−46.7		26	322	−35.4		25	314	−41.3		22	327	−29.5		30	312	−42.2	
10,000	25	264	−53.1		28	267	−48.6		24	261	−52.2		25	278	−42.7		25	270	−47.6		21	284	−36.8		29	269	−48.7	
11,000	18	227	−56.7		25	230	−54.1		23	224	−56.6		25	239	−50.0		25	232	−52.9		20	246	−44.3		23	231	−54.1	
12,000	9	194	−60.2		23	197	−57.6		20	191	−58.0		24	205	−56.2		22	199	−56.2		17	211	−52.3		18	198	−57.2	
13,000					13	168	−58.6		14	163	−58.2		21	175	−61.8		22	170	−60.0		13	180	−59.3		8	170	−58.0	
14,000					9	142	−59.1		9	138	−57.0		19	149	−64.6		19	144	−61.9		9	153	−65.9		5	146	−60.8	
15,000					5	121	−60.5		6	118	−58.0		19	126	−67.6		14	123	−64.0						5	124	−63.0	
16,000													16	107	−70.7		9	104	−64.5									
17,000													13	90	−71.7													
18,000													7	76	−70.0													
19,000													5	64	−68.1													

	Sault Ste. Marie, Mich. (221 m.)				Seattle, Wash.[1] (22 m.)				Spokane, Wash. (598 m.)				Swan Island, West Indies (10 m.)				Tacubaya, Mexico (2,306 m.)				Tampa, Fla. (3 m.)				Tatoosh Island, Wash. (31 m.)			
Surface	30	991	1.1	84	26	1,010	8.9	81	30	946	2.5	88	16	1,014	25.0	77	29	774	14.3	63	28	1,018	17.4	81	30	1,008	9.0	85
500	30	957	0.1	84	26	954	6.4	74					16	959	21.4	80					28	961	16.1	69	30	952	7.0	79
1,000	30	900	−1.3	81	26	897	3.4	77	30	900	1.8	84	16	905	17.6	82					28	906	13.3	63	30	896	4.0	78
1,500	30	845	−2.3	78	26	843	0.4	77	30	846	−0.4	80	16	854	15.6	67					28	854	11.6	49	30	842	1.1	80
2,000	30	793	−3.7	73	26	792	−2.0	72	30	794	−2.2	76	16	805	13.4						28	804	10.4		30	791	−1.3	78
2,500	30	744	−5.8	66	26	743	−4.7	66	30	746	−4.2	68	16	758	11.4		29	757	13.3	61	28	757	8.4		30	743	−4.1	74
3,000	30	698	−7.9	62	26	697	−7.6	60	30	700	−6.7	64	16	714	9.7		29	713	10.1	63	28	712	5.8		30	697	−6.7	65
4,000	30	613	−13.0	57	26	612	−13.5	58	30	615	−11.6	59	16	632	5.4		29	631	2.5	72	28	629	0.1		30	612	−12.2	54
5,000	30	537	−19.1	67	26	536	−19.9	57	30	539	−18.1	59	16	559	−0.7		29	557	−3.6	55	28	555	−6.0		28	537	−18.6	53
6,000	29	468	−25.7		26	468	−26.7	56	30	471	−24.5		14	492	−6.6		29	490	−9.3	40	28	487	−12.8		26	469	−26.0	50
7,000	29	407	−32.8		26	406	−34.5	57	30	409	−32.3		14	432	−13.6		28	430	−15.9		28	427	−19.9		25	408	−33.1	
8,000	28	352	−39.9		25	351	−41.9		30	354	−40.0		11	378	−20.9		27	376	−22.8		27	372	−27.1		23	353	−40.1	
9,000	28	304	−46.5		23	302	−48.3		30	305	−46.6		9	329	−27.6		27	327	−30.4		26	323	−34.6		22	304	−46.3	
10,000	27	261	−52.0		22	259	−54.1		28	262	−52.8		9	286	−35.0		27	284	−38.4		25	280	−42.7		19	261	−53.3	
11,000	25	224	−55.5		21	222	−57.2		24	225	−56.9		8	247	−43.4		27	245	−46.7		24	240	−50.0		17	224	−57.8	
12,000	19	190	−55.9		19	189	−58.6		18	192	−59.2		8	213	−51.3		24	210	−55.1		24	206	−56.6		10	190	−59.7	
13,000	11	163	−57.8		16	161	−57.6		7	164	−58.5		8	182	−58.8		15	179	−62.2		20	176	−61.4					
14,000	5	140	−59.8		11	137	−57.4						8	154	−65.6						10	149	−64.5					
15,000					6	117	−59.3																					

	Toledo, Ohio (191 m.)				Tongue Point, Oreg. (21 m.)[1][2]				Washington, D. C. (25 m.)			
Surface	30	995	4.4	82					30	1,015	7.6	73
500	30	958	3.9	78					30	958	6.0	69
1,000	30	900	1.3	78					30	901	3.3	67
1,500	30	846	−0.5	75					30	848	1.1	68
2,000	30	794	−2.3	66					30	796	−0.8	61
2,500	30	746	−4.1	60					30	747	−3.3	61
3,000	30	700	−6.1	52					30	702	−5.1	51
4,000	29	615	−11.6	51					29	617	−10.1	45
5,000	29	540	−17.7	52					29	542	−16.1	45
6,000	28	471	−24.3						29	474	−22.7	
7,000	28	409	−31.0						29	412	−29.2	
8,000	27	354	−37.6						29	357	−35.8	
9,000	27	306	−43.9						29	309	−42.3	
10,000	26	264	−49.3						28	266	−48.4	
11,000	24	226	−53.3						25	229	−53.0	
12,000	22	194	−56.6						24	196	−57.2	
13,000	16	164	−57.2						20	167	−57.8	
14,000	10	139	−54.5						14	142	−57.8	
15,000	6	118	−54.0						9	121	−59.7	
16,000									6	103	−62.3	

[1] U. S. Navy.
[2] No observations taken.

NOTE.—All observations taken near 11 p. m. E. S. T. except at Mazatlan and Merida where they are taken near 9:00 p. m.

"Number of observations" refers to pressure only, as temperature and humidity data are sometimes missing for some observations at certain levels. Relative humidity data are not used in daily observations when the temperature is below −40.0° C.

None of the means included in these tables are based on less than 15 surface or 5 standard level observations.

All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the values occurring below the operating range of the humidity element.

TABLE 2.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during November 1944. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (538 m.)			Albuquerque, N. Mex. (1,630 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (870 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (132 m.)			Charleston, S. C. (17 m.)			Cincinnati, Ohio (152 m.)			Denver, Colo. (1,627 m.)			El Paso, Tex. (1,196 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	27	199	1.6	30	244	0.9	28	316	1.8	27	294	1.8	21	7	0.9	30	133	1.5	28	135	2.6	27	299	1.5	27	341	0.4	28	302	1.2	29	278	1.4	29	28	1.2	30	227	1.2
500							28	307	1.8										28	137	4.3	27	263	1.8	27	220	0.9	28	266	2.8	29	269	2.3						
1,000	27	228	3.7				26	292	2.6	27	276	3.3	29	310	2.0	30	139	1.9	26	146	3.3	18	249	5.1	23	244	2.7	27	274	3.8	24	277	3.2				30	234	1.2
1,500	25	229	5.4				24	302	3.9	27	276	3.3	12	263	2.9	30	156	2.4	22	165	2.2	16	261	6.0	18	260	4.1	24	296	6.7	15	247	4.0				30	234	2.9
2,000	24	246	5.9	30	233	2.0	22	300	7.3	27	266	4.9	11	281	3.5	26	197	2.9	20	216	3.1	12	259	6.1	14	284	3.4	23	295	8.1	12	249	5.2	29	53	1.3	27	241	5.5
2,500	23	263	6.9	30	252	3.2	21	301	9.1	27	268	6.1	11	297	4.8	16	205	6.7	18	224	4.3				12	273	3.7	21	288	10.9	10	252	6.2	29	269	0.7	25	251	7.7
3,000	21	264	9.1	28	260	5.2	19	296	8.7	26	270	6.9	10	299	4.2	14	221	6.6	17	254	5.0				12	260	4.8	19	286	12.7	10	255	7.9	29	280	2.9	23	254	11.6
4,000	18	265	11.4	23	263	9.2	18	288	11.0	22	286	6.5	10	297	5.1				13	251	7.8				11	276	5.1	13	290	14.1				26	288	5.5	15	264	14.1
5,000	17	271	13.4	21	264	12.0	17	288	12.2	20	294	9.2							12	257	9.3				11	284	6.2	12	291	15.2				25	292	7.6			
6,000	15	271	14.9	20	266	12.4	16	282	13.0	17	295	6.1							10	268	12.9													20	278	7.5			
8,000	10	272	22.5	16	255	15.2	10	275	17.4	11	326	8.6																						17	258	10.5			
10,000				11	270	22.1																												12	266	13.6			
12,000				10	245	23.2																																	
14,000																																							

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (573 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (410 m.)			Miami, Fla. (15 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (194 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	28	160	0.4	28	303	1.6	26	302	1.7	22	291	1.0	30	44	1.5	27	233	1.4	30	49	1.5	28	184	1.0	27	255	0.6	30	56	1.4	27	295	1.2	28	300	1.5	25	312	4.2
500							26	297	2.5				29	288	1.6	27	232	2.3				28	221	1.0	27	206	0.4	30	44	2.5	27	273	1.8	28	270	1.0	25	308	3.8
1,000							24	310	3.7	22	263	2.7	27	273	3.6	21	196	4.3	30	61	1.7	26	244	2.1	27	159	2.6	30	38	2.5	25	293	2.5	27	248	2.2	23	328	5.6
1,500				28	304	1.6	24	317	5.6	21	263	4.7	27	283	5.4	14	220	4.5	30	50	0.5	26	268	4.3	26	189	3.5	30	5	2.3	24	290	4.8	23	273	3.9	22	327	5.9
2,000	28	176	0.4	28	288	1.0	22	307	7.3	18	275	5.2	26	287	6.9				29	234	1.0	21	290	6.4	24	204	3.8	28	341	3.2	24	274	5.7	19	279	6.8	17	311	7.5
2,500	28	220	1.1	28	233	1.9	18	308	8.3	18	272	6.6	26	284	9.2				28	268	1.6	19	281	8.9	21	232	2.6	28	322	3.3	22	274	7.2	19	290	8.7	15	319	5.8
3,000	26	221	2.4	28	229	3.2	17	310	10.3	17	275	8.2	26	282	11.3				25	296	1.9	18	284	9.7	17	336	2.0	28	303	4.3	17	284	7.5	19	291	9.5	14	315	5.9
4,000	18	239	3.7	25	248	3.8	16	301	11.5	14	279	7.5	24	282	12.4				23	316	4.3	16	283	12.4	15	333	3.0	24	284	6.4	12	284	8.3	19	286	14.0			
5,000	15	266	3.1	17	267	6.0	15	294	14.7	13	268	8.8	22	279	13.6				22	296	5.4	13	294	13.9	12	8	5.6	23	285	9.4				19	290	16.8			
6,000	13	288	2.9	14	305	7.5	13	299	16.9	10	260	9.9	20	278	16.1				21	295	8.8	12	293	15.6	10	4	7.1	20	279	12.5				14	289	17.3			
8,000	11	300	6.8										15	277	19.9				15	331	13.7							17	288	19.3									
10,000													10	292	22.4													14	290	28.0									
12,000																																							
14,000																																							

Altitude (meters) m. s. l.	Okland, Calif. (8 m.)			Oklahoma City, Okla. (402 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, Mich. (225 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	28	214	1.3	27	227	2.2	28	300	1.0	30	112	0.5	26	348	3.5	28	195	1.6	27	179	0.4	27	166	0.8	26	246	3.0	26	54	1.6	26	182	1.8	28	156	0.5	27	308	2.6
500	28	253	1.1	27	227	3.0	28	273	1.4	30	124	0.4				28	223	2.9	27	143	1.3	27	178	1.4	26	277	2.4	26	74	1.9	25	187	5.4				27	306	4.4
1,000	23	308	0.6	27	232	4.7	23	246	3.6	30	171	0.7	26	344	3.4	21	216	5.1	15	183	2.8	25	187	2.7	24	318	1.4	19	315	1.3	22	190	7.5	28	162	2.1	26	303	5.5
1,500	23	315	1.6	24	251	7.0	15	246	6.3	30	166	1.8	26	312	4.5	13	233	6.5	12	189	4.7	24	201	3.1	22	15	1.4	12	296	1.7	20	203	6.1	23	199	4.5	26	307	6.0
2,000	20	313	2.5	24	252	9.5	12	244	8.3	26	167	2.4	25	307	6.2	12	245	8.2	10	200	5.9	18	244	4.2	22	351	2.3				14	204	6.6	16	197	4.6	20	297	6.0
2,500	19	317	3.6	22	257	11.0	10	258	8.0	26	194	2.8	25	310	7.0	11	261	9.4				17	252	6.1	21	336	2.4				13	210	5.7	13	205	4.3	17	310	6.9
3,000	18	329	4.4	20	272	13.4				25	202	3.2	25	304	6.3							14	259	7.3	20	335	3.5				12	223	5.0	10	222	3.0	15	295	7.4
4,000	18	332	6.0	18	276	15.7				25	242	5.1	22	305	7.4							13	269	9.3	17	321	4.5				12	245	5.5				12	300	8.9
5,000	17	331	8.4	17	275	16.5				21	248	7.4	19	296	8.1							11	269	13.7	16	305	6.3										12	291	11.4
6,000	14	340	9.7	12	277	16.6				21	257	9.6	18	290	7.8							10	264	16.6	16	309	7.5										10	310	14.7
8,000										17	256	15.3	11	292	10.6										13	336	13.2												
10,000										15	259	19.3													11	328	13.7												
12,000																																							
14,000																																							

TABLE 3.—*Maximum free air wind velocities, (m. p. s.), for different sections of the United States based on pilot balloon observations during November 1944*

Section	Surface to 2,500 meters (m. s. l.)					Above 2,500 to 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station
Northeast [1]	40.4	SW.	437	30	Nantucket, Mass.	48.4	NNW.	5,000	13	Burlington, Vt.	58.4	NE.	9,017	25	Philadelphia, Pa.
East-Central [2]	34.0	NW.	2,160	30	Greensboro, N. C.	60.5	W.	5,000	30	Knoxville, Tenn.	84.7	WNW.	10,022	18	Huntington, W. Va.
Southeast [3]	33.6	W.	2,472	30	Charleston, S. C.	47.6	NW.	3,871	23	Jacksonville, Fla.	74.2	W.	11,611	24	Jacksonville, Fla.
North-Central [4]	35.5	SSW.	1,783	23	Rapid City, S. Dak.	43.9	NNW.	5,000	23	Fargo, N. Dak.	69.6	SW.	8,952	24	Williston, N. Dak.
Central [5]	39.6	SSW.	2,330	24	Dodge City, Kans.	54.2	NW.	4,856	23	St. Louis, Mo.	52.4	NW.	5,126	23	St. Louis, Mo.
South-Central [6]	35.6	NNW.	1,011	9	Houston, Tex.	44.6	WSW.	4,957	13	Amarillo, Tex.	75.0	WSW.	10,107	13	Amarillo, Tex.
Northwest [7]	35.9	NW.	2,235	21	Glasgow, Mont.	41.5	NW.	4,548	21	Great Falls, Mont.	73.3	NNW.	6,582	24	Burns, Oreg.
West-Central [8]	33.3	N.	2,500	25	Pueblo, Colo.	53.0	NNW.	5,000	24	Reno, Nev.	68.0	WNW.	14,095	28	Ely, Nev.
Southwest [9]	32.6	WSW.	1,999	24	El Paso, Tex.	41.0	WSW.	4,258	13	Roswell, N. Mex.	79.0	WSW.	10,188	13	Phoenix, Ariz.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By C. R. JORDAN

PRECIPITATION during November averaged well above normal over a considerable part of the country, particularly along the north Atlantic coast, central Gulf coast, in the northern Great Plains, and the Southwest. Some localities in the Dakotas and the far Southwest received over four times the normal precipitation for the month. Rainfall continued below normal in the Ohio Valley, the Southeast, western Texas, parts of Colorado and New Mexico, and the far Northwest.

River stages were generally low during November and little flooding was reported.

Atlantic Slope Drainage.—Light to heavy rain that occurred over North Carolina from November 27–30, caused rises in all rivers in that area. The Neuse River was above flood stage and still rising at Smithfield and Neuse, N. C., as the month closed.

Red Basin.—The Sulphur River at Hagansport, Tex., was slightly above flood stage on the 9th and again on the 25th–26th. Only minor flooding occurred and no damage was reported.

FLOOD-STAGE REPORT FOR NOVEMBER 1944

[All dates in November unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	Feet			*Feet*	
Roanoke: Williamston, N. C.	10	Oct. 26	1	10.9	Oct. 28
Neuse:					
Neuse, N. C.	14	28	(2)		
Smithfield, N. C.	13	29	(2)	14.2	30
MISSISSIPPI SYSTEM					
Red Basin					
Sulphur: Hagansport, Tex.	38	9	9	38.2	9
		25	26	28.6	26

[1] Provisional.
[2] Continued at end of month.

CLIMATOLOGICAL DATA

CONDENSED CLIMATOLOGICAL SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS

[For description of tables and charts, see REVIEW, January 1943, p. 15]

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Section	Temperature								Precipitation					
			Monthly extremes								Greatest monthly		Least monthly	
	Section average	Departure from the normal	Station	Highest	Date	Station	Lowest	Date	Section average	Departure from the normal	Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	54.9	+0.6	Wetumpka	85	1	Valley Head	23	24	3.70	+0.49	Citronelle	11.82	Columbia	1.47
Arizona	47.9	−2.9	2 stations	92	5	Alpine	−7	26	1.77	+.81	Crown King	5.01	Lees Ferry	.43
Arkansas	52.7	+1.4	Pine Bluff	87	1	2 stations	17	28	4.70	+.97	Hope	8.97	Fayetteville	1.35
California	49.0	−3.2	Blythe	92	3	Ellery Lake	−4	[1] 16	5.49	+3.09	Upper Mattole	18.66	Halwee	.39
Colorado	35.5	+.1	Eversoll Ranch	84	11	3 stations	−18	[1] 26	1.13	+.36	Wolf Creek Pass	4.99	Canon City	T
Florida	64.2	−.8	2 stations	91	[1] 4	High Springs	28	22	1.55	−.60	Niceville	8.92	2 stations	T
Georgia	53.5	−1.0	3 stations	82	[1] 1	Blairsville	19	6	2.48	−.10	Clayton	6.29	Cordele	1.33
Idaho	33.5	−1.9	Kooskia	65	1	Sun Valley	−15	[1] 18	2.24	+.19	Deception Creek	6.25	May	.28
Illinois	44.9	+2.7	3 stations	82	1	Mount Carroll	12	30	1.86	−.75	Mount Sterling	4.58	Hudson	.41
Indiana	44.2	+1.8	New Harmony	83	[1] 1	Winamac	11	30	2.45	−.59	Wabash	4.82	Kentland	.93
Iowa	40.4	+4.0	Fairfield	81	1	Inwood	0	30	1.73	+.12	Washington	5.18	Clarion	.46
Kansas	45.8	+2.5	3 stations	85	1	2 stations	5	30	1.96	+.69	Tongoxie	4.70	Ulysses	.57
Kentucky	46.5	+.1	Lovelaceville	84	[1] 1	4 stations	18	[1] 6	2.45	−.91	Gilbertsville	5.08	Anchorage	1.41
Louisiana	59.5	+.7	2 stations	88	[1] 2	do	25	[1] 28	7.88	+3.97	Houma	15.50	Doyline	3.13
Maryland-Delaware	45.1	−.1	Crisfield, Md	78	10	Oakland, Md	8	25	3.57	+1.00	Millsboro, Del	6.53	Luke, Md	1.49
Michigan	39.3	+3.0	8 stations	78	1	3 stations	5	[1] 6	2.53	.00	Deer Park	4.76	Detour	.80
Minnesota	34.8	+5.1	Winona	79	1	Roseau	−6	30	1.69	+.53	Pigeon River Bridge	5.24	Wells	.61
Mississippi	55.6	+.6	2 stations	86	[1] 1	Water Valley	23	30	5.18	+1.57	Merrill	11.24	Corinth	2.44
Missouri	47.0	+2.6	Arcadia	88	1	Tarkio	1	30	2.34	−.33	Linneus	5.60	Jefferson Barracks	.85
Montana	30.7	−1.4	3 stations	68	[1] 1	3 stations	−23	[1] 29	.82	−.20	Hebgen Dam	3.10	Conrad	.07
Nebraska	38.1	+.8	2 stations	80	1	Nenzel (near)	−15	30	1.51	+.76	Mumper	3.95	Atkinson	.53
Nevada	36.0	−3.9	Mesquite	98	3	Fish Creek Ranch	−21	15	1.86	+1.18	Marlette Lake	6.19	2 stations	.23
New England	38.5	+.5	Fitchburg, Mass	74	3	Somerset, Vt	5	24	4.86	+1.33	Wood River Junction, R. I.	11.28	Waterbury, Vt. (near)	1.11
New Jersey	43.9	+.2	Hammonton	76	9	Charlotteburg	13	24	6.44	+3.24	Pleasantville	9.45	Layton	3.23
New Mexico	41.5	−1.0	Maljamar	87	4	Selsor Ranch	−16	26	.96	+.32	Mogollon	2.74	Arch	.00
New York	39.0	+.9	Rochester	76	1	Indiana Lake	6	[1] 26	3.35	+.34	Cutchogue	11.32	Burdett	.79
North Carolina	48.3	−1.6	High Point	82	8	Mount Mitchell	1	30	3.42	+.79	Highlands	7.37	Manteo	1.42
North Dakota	27.0	+.2	4 stations	70	1	Stanley	−21	30	2.25	+1.64	Richardton	6.11	Bottineau	.28
Ohio	42.6	+1.1	5 stations	78	[1] 1	2 stations	14	[1] 7	2.06	−.63	Shaker Heights	4.15	Wooster No. 1	1.03
Oklahoma	52.3	+2.5	Frederick	89	1	do	11	30	2.75	+.74	Cloudy Tower	9.85	Kenton	.48
Oregon	37.6	−2.8	2 stations	69	4	Round Grove	−3	[1] 14	3.32	−.36	Brookings	15.57	Mitchell	.56
Pennsylvania	41.6	+.3	Uniontown	78	2	Somerset	7	26	2.81	−.05	George School	6.50	Saxton	1.26
South Carolina	52.4	−1.4	Walterboro	85	[1] 8	Walhalla	23	6	2.20	−.10	Caesars Head	5.68	Gaffney	1.18
South Dakota	33.1	−.1	Vermillion	82	1	3 stations	−14	30	1.98	+1.35	Spearfish	7.10	Hermosa	.58
Tennessee	48.5	.0	Clarksville	82	1	5 stations	20	[1] 6	3.23	−.26	Brownsville	6.07	Moscow	1.55
Texas	57.7	+.6	2 stations	93	[1] 1	2 stations	11	30	3.49	+1.37	Smithville	10.45	Friona	.01
Utah	36.2	−1.2	do	79	[1] 3	Woodruff	−10	28	1.67	+.71	Silver Lake (Brighton)	6.73	Emery	.00
Virginia	45.8	−.8	do	79	[1] 8	Mountain Lake	9	25	2.64	+.22	Randolph	5.27	Afton	.46
Washington	39.6	+.2	Mottinger	78	1	Stockdill Ranch	5	28	4.84	−.05	Kelly's Ranch	21.60	Clarkston Heights	.75
West Virginia	42.5	−.7	2 stations	79	2	Bayards	5	26	2.22	−.51	Pickens No. 2	4.47	Brushy Run	.87
Wisconsin	39.0	+5.6	Kenosha	81	1	Grantsburg	10	30	2.39	+.53	Oshkosh	4.97	Mondovi	.76
Wyoming	30.7	−.9	Hulett	74	11	Afton	−19	26	1.09	+.37	Bechler River	5.74	Deaver	.02
Alaska (October)	33.5	+3.1	Radioville	67	1	Wiseman	−12	26	4.53	+.19	Little Port Walter	51.91	Lake Minchumina	.16
Hawaii	72.1	+.2	Waianae	92	[1] 2	Haleakala	38	[1] 20	5.79	−1.70	Kukui	60.00	3 stations	.00
Puerto Rico	75.7	−.6	Guayama	97	9	Cayey	50	19	4.05	−3.54	Mameyes (Utuado)	9.66	Santa Isabel	.30

[1] Other dates also.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°F.	°F.	°F.		°F.	°F.		°F.	°F.		°F.	%	*In.*	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
New England							40.4	+1.5										82	6.10	+2.9											6–6			
Eastport	75	67	85	1,012.2	1,015.6	−0.7	39.8	+3.1	63	3	45	24	29	35	22	754	34	81	4.53	+1.2	1.98	12	14.3	ne	46	e.	30	6	6	18	7.2	.7	T	
Greenville, Maine	1,070	6	41	976.0	1,016.9	.....	33.5	+2.9	66	3	40	12	29	26	33	943	30	...	3.90	+.8	2.30	10	...	n.	...	.....	...	...	3	23	.....	9.5	2.5	0
Portland, Maine [1]	103	5	43	1,011.5	1,015.9	−.4	38.2	+.2	63	3	46	21	15	30	29	806	34	88	6.59	+3.1	2.71	13	10.4	n.	47	sw.	30	10	4	16	6.3	8.2	.0	0
Concord [1]	280	5	45	1,005.1	1,016.3	−1.7	37.0	+1.6	69	3	46	16	26	28	37	843	30	84	3.17	+.1	1.23	13	8.7	nw.	42	ne.	30	8	4	18	7.0	10.3	T	0
Burlington [1]	403	5	51	1,001.4	1,016.9	−.7	37.4	+1.1	65	3	43	19	29	31	22	832	32	84	1.96	−.7	.69	11	9.4	nw.	33	s.	27	5	2	23	8.0	9.3	3.8	0
Boston [1]	124	33	62	1,010.2	1,015.2	−2.4	43.2	+1.2	69	4	50	29	26	36	24	657	35	76	5.68	+2.4	2.25	11	13.4	nw.	48	ne.	30	10	3	17	6.5	1.2	.0	0
Nantucket	12	11	59	1,013.5	1,014.6	−3.0	44.9	+.5	65	2	50	34	25	40	19	604	38	83	8.76	+5.5	2.60	14	13.4	nw.	49	ne.	21	7	7	16	6.5	.0	.0	0
Block Island	26	11	46	1,013.5	1,014.9	−3.1	44.9	+.3	62	1	51	30	26	39	24	602	39	82	9.73	+6.1	2.67	13	18.7	n.	56	w.	30	11	6	13	5.6	T	.0	1
Providence [2]	159	46	60	1,009.1	1,015.6	−2.7	43.6	+3.2	68	4	51	28	26	36	26	643	34	80	7.52	+4.5	2.78	12	9.3	n.	49	sw.	30	9	6	15	6.3	.6	.0	1
Hartford [1]	159	5	44	1,009.8	1,016.3	−2.3	40.4	+.9	68	1	49	20	24	32	34	741	34	82	7.14	+3.6	2.37	11	9.0	n.	30	sw.	30	7	8	15	6.6	6.6	.0	1
New Haven [1]	107	5	39	1,011.5	1,015.9	−2.4	41.8	+1.9	67	3	50	24	24	34	32	695	34	78	8.14	+5.1	2.51	12	8.2	n.	34	w.	30	10	6	14	6.1	1.0	.0	1
Middle Atlantic							45.7	+1.0										77	4.15	+1.6											6.6			
Albany [1]	97	26	40	1,012.5	1,016.6	−2.0	38.6	+2.3	66	3	45	22	20	32	25	786	32	82	2.53	.0	.94	12	9.3	n.	30	sw.	30	4	5	21	7.5	3.6	.9	0
Binghamton [2]	871	60	79	984.8	1,018.0	−1.0	40.0	+1.3	70	1	46	25	26	33	31	750	34	86	3.03	+.6	.86	16	6.1	w.	24	w.	30	4	4	22	8.0	8.9	4.2	0
New York	314	415	454	1,004.1	1,016.3	−2.7	46.0	+1.8	70	3	53	29	26	39	24	571	36	71	7.14	+4.2	2.40	9	15.5	nw.	51	w.	30	4	4	22	8.0	8.9	4.2	0
Harrisburg [1]	374	30	49	1,003.7	1,018.0	−1.6	44.3	+1.5	68	8	51	24	26	37	34	622	36	76	3.39	+1.1	1.37	8	8.3	nw.	27	w.	30	4	5	21	7.5	.3	.0	0
Philadelphia [1]	114	6	56	1,012.5	1,017.3	−2.0	45.6	+1.7	73	1	54	26	26	37	32	584	36	78	4.71	+2.0	1.95	8	8.9	nw.	33	w.	30	4	5	21	7.5	.3	.0	0
Reading	323	47	306	1,005.1	1,017.6	.....	45.0	+1.2	67	9	52	26	26	38	32	595	...	...	4.30	+1.6	1.50	10	11.3	nw.	43	w.	30	4	9	17	7.3	.3	.0	0
Scranton	805	72	104	987.8	1,018.0	−1.0	41.0	+.5	67	2	47	26	30	35	29	719	...	...	2.22	−.6	.54	13	6.2	n.	27	sw.	30	4	8	20	7.4	2.1	.0	0
Atlantic City	52	37	172	1,014.2	1,016.6	−2.7	46.6	+1.0	64	8	53	30	26	40	22	553	39	80	9.06	+6.2	3.49	9	15.8	nw.	47	n.	20	5	11	14	6.4	T	.0	0
Trenton	190	89	107	1,009.5	1,016.9	.....	45.2	+.8	70	1	52	28	26	38	27	597	36	74	5.22	+2.5	1.99	9	9.3	nw.	27	w.	30	7	9	14	6.6	.2	.0	0
Baltimore [1]	123	100	215	1,012.9	1,018.0	−1.6	48.0	+1.7	71	8	55	29	30	41	25	515	37	73	3.93	+1.4	1.99	9	9.8	nw.	40	sw.	30	8	14	8	5.8	T	.0	0
Washington [2]	112	56	100	1,013.5	1,018.3	−1.7	47.4	+2.2	74	8	55	27	26	40	37	526	37	72	3.29	+.9	1.83	9	7.7	nw.	31	nw.	21	6	13	11	6.2	T	.0	0
Cape Henry	18	8	54	1,016.3	1,017.3	.....	50.9	−1.2	71	1	56	34	30	46	28	422	44	80	3.59	+1.2	1.37	9	15.0	nw.	43	nw.	6	6	12	12	6.1	.0	.0	0
Lynchburg	686	144	184	993.2	1,018.6	−1.7	46.4	−.8	75	8	55	25	30	38	39	559	35	72	2.03	−.3	1.08	8	7.7	nw.	26	w.	30	8	10	12	6.1	T	.0	0
Norfolk [2]	91	80	125	1,014.2	1,018.3	−1.3	51.1	−.3	74	9	58	33	30	45	31	420	42	80	4.08	+1.9	1.57	9	10.3	n.	31	nw.	21	9	9	12	5.8	.0	.0	0
Richmond	144	11	52	1,012.2	1,017.6	−2.4	48.9	+.6	75	1	58	26	26	40	39	483	38	76	3.77	+1.6	2.43	9	7.7	nw.	27	sw.	30	9	8	13	5.7	.0	.0	0
South Atlantic							53.4	−0.7										79	2.49	+0.1											5.2			
Asheville	2,253	77	92	938.7	1,019.6	−1.1	45.1	.0	75	8	54	23	30	36	44	596	35	75	1.95	−.3	.58	8	9.4	nw.	25	nw.	30	8	6	16	6.6	.6	T	0
Charlotte [2]	779	63	86	990.2	1,019.0	−1.3	49.8	−.8	73	1	58	32	30	41	31	453	39	80	3.23	+.7	1.24	9	6.1	ne.	19	sw.	30	9	4	17	6.4	.0	.0	0
Greensboro [1]	886	6	56	986.5	1,019.3	.....	46.9	...	74	1	57	25	7	37	39	542	38	81	3.38	.....	1.93	9	7.2	nw.	25	nw.	21	8	10	12	6.1	T	.0	0
Hatteras	11	5	50	1,016.6	1,017.3	−2.3	54.0	−2.3	72	3	60	39	25	48	22	327	47	82	5.80	+2.3	2.01	9	14.2	n.	41	w.	30	12	12	6	4.8	.0	.0	0
Raleigh [1]	376	5	69	1,004.7	1,019.0	−1.3	49.6	−.3	75	1	59	30	25	40	36	462	40	80	3.41	+1.1	1.12	10	9.2	nw.	31	nw.	21	10	7	13	5.7	.0	.0	0
Wilmington	72	73	107	1,015.6	1,018.6	−1.4	54.4	−1.6	76	3	63	32	25	45	29	317	46	82	2.07	+.1	1.06	9	8.6	n.	28	nw.	21	12	11	7	4.6	.0	.0	0
Charleston [2]	48	11	92	1,016.6	1,018.6	−1.4	54.4	−1.6	76	3	63	32	25	45	29	317	46	82	2.07	+.1	1.06	9	8.6	n.	28	nw.	21	12	11	7	4.6	.0	.0	0
Columbia, S. C.	347	70	91	1,005.8	1,019.0	−1.0	53.8	−.2	75	1	63	32	22	44	29	340	43	78	1.29	−.7	.84	6	7.6	ne.	25	sw.	27	11	10	9	4.9	.0	.0	0
Greenville, S. C.	1,040	18	36	981.0	1,019.3	.....	50.0	+.4	70	1	58	30	22	41	30	454	39	75	3.15	.0	1.57	7	8.4	ne.	34	n.	5	10	9	11	5.5	.0	.0	0
Augusta [2]	182	62	77	1,012.2	1,019.0	−1.3	54.2	−.3	75	2	64	33	22	44	36	327	41	68	1.59	−.8	.68	8	5.4	nw.	18	w.	30	12	7	11	4.9	.0	.0	0
Savannah [2]	65	73	152	1,016.3	1,019.3	−.7	58.1	−.4	78	1	68	34	22	48	26	214	46	83	1.67	−.4	1.05	7	10.3	n.	33	nw.	29	12	9	9	4.8	.0	.0	1
Jacksonville [2]	43	86	110	1,017.3	1,019.3	.0	61.2	−1.0	79	9	70	39	22	52	26	142	50	82	1.19	−.8	.73	5	8.3	ne.	27	nw.	29	16	8	6	4.1	.0	.0	0
Florida Peninsula							70.0	−1.2										80	0.41	−2.0											3.6			
Key West [2]	21	10	64	1,016.6	1,017.6	+1.0	73.4	−.9	82	9	78	58	23	69	16	1	64	78	.29	−1.9	.18	3	9.5	n.	24	n.	30	20	8	2	3.0	.0	.0	0
Miami [2]	25	242	249	1,016.3	1,017.6	−.4	70.1	−2.4	81	10	75	48	22	65	20	22	59	84	.23	−3.0	.12	4	12.7	ne.	32	nw.	30	16	13	1	3.4	.0	.0	0
Tampa [1]	35	6	43	1,016.9	1,018.6	.0	66.5	−.4	82	4	76	43	22	58	24	45	56	79	.70	−1.0	.56	4	9.3	ne.	31	nw.	29	12	13	5	4.4	.0	.0	1
East Gulf							56.6	+0.6										79	5.48	+2.2											5.6			
Atlanta [1]	1,173	33	72	977.0	1,019.6	−.7	51.0	−.5	73	14	60	31	30	42	34	423	38	70	2.60	−.5	1.19	9	10.9	nw.	32	w.	23	10	7	13	5.9	T	.0	1
Macon [2]	370	79	87	1,005.8	1,019.3	−1.0	53.4	−.8	75	14	64	32	24	43	37	350	42	76	1.87	−.6	.64	8	6.6	nw.	22	s.	27	12	7	11	5.3	.0	.0	1
Thomasville	273	49	58	1,009.8	1,020.7	+.7	58.9	.....	78	1	70	37	30	48	30	188	...	...	2.28	.....	1.13	7	...	...	...	.....	...	13	7	10	.....	.0	.0	1
Apalachicola	35	11	51	1,017.3	1,018.6	.....	61.4	+.1	79	16	69	37	30	54	24	132	54	80	4.76	+1.7	2.29	5	8.6	e.	28	se.	27	12	8	10	4.9	.0	.0	1
Pensacola	56	54	79	.....	1,019.0	−.6	60.7	+.5	81	5	69	34	30	52	...	167	51	80	7.15	+3.4	2.84	8	7.6	n.	22	n.	25	12	7	11	.....	.0	.0	2
Anniston	741	9	...	.....	.....	.....	52.5	+.3	80	1	63	29	24	42	38	378	...	...	2.84	−.4	1.53	8	...	nw	...	.....	...	13	7	10	.....	.0	.0	4
Birmingham [1]	700	5	62	993.9	1,019.6	−.4	52.2	+.8	79	1	63	27	28	41	37	390	42	76	2.49	.....	1.76	8	8.1	n.	33	se.	25	9	10	11	5.6	T	.0	0
Mobile [2]	57	86	161	1,016.9	1,019.3	−.3	60.5	+1.9	81	1	69	36	30	52	31	174	50	82	6.18	+2.5	3.39	12	6.4	n.	32	n.	25	9	8	13	6.0	.0	.0	1
Montgomery [2]	218	92	105	1,011.5	1,019.6	−.4	56.4	+.6	80	1	66	35	30	47	32	266	45	80	4.78	+1.6	1.70	9	6.9	n.	24	e.	25	13	5	12	5.2	.0	.0	3
Meridian [2]	375	67	92	1,005.4	1,019.6	−.4	54.6	+.4	79	2	64	30	30	45	35	319	46	84	5.75	+2.4	2.37	10	5.6	e.	26	e.	25	11	6	13	5.9	T	.0	1
Vicksburg [2]	247	82	102	1,009.5	1,018.6	−1.4	57.2	+.6	81	2	66	33	30	49	27	257	44	85	6.44	+2.7	2.25	9	8.2	se.	29	se.	8	8	7	15	6.0	.0	.0	3
New Orleans [4]	53	50	84	1,016.6	1,018.6	−.7	63.1	+2.5	81	5	70	41	30	56	21	125	54	78	12.38	+9.2	6.26	12	6.5	se.	17	e.	2	9	9	12	6.0	.0	.0	3
West Gulf							60.3	+1.8										79	4.35	+1.4											6.4			
Shreveport [1]	249	5	64	1,009.1	1,018.6	−1.0	57.6	+2.6	82	8	67	29	27	48	38	262	48	80	4.47	+.8	1.78	11	8.7	se.	26	e.	24	7	10	13	6.0	.0	.0	2
Fort Smith	463	57	82	1,000.7	1,017.6	−2.0	53.6	+2.6	81	1	62	29	22	46	31	365	44	76	2.97	+.1	1.27	6	7.8	e.	24	e.	24	9	6	15	6.1	.0	.0	2
Little Rock [1]	357	26	58	1,005.4	1,019.0	−1.0	52.9	+.8	80	2	62	26	28	44	31	376	43	74	6.08	+1.9	3.47	7	8.2	nw.	24	e.	24	5	10	15	6.6	.0	.0	3
Austin [1]	605	10	41	995.9	1,017.6	.....	59.8	+1.3	84	7	69	31	30	50	35	218	50	78	4.55	+2.2	1.89	10	8.0	s.	25	ne.	15	7	6	17	6.8	.0	.0	4
Brownsville [1]	57	5	54	1,013.5	1,015.6	.....	68.2	+1.0	87	8	76	44	30	60	29	76	60	82	1.65	−1.6	.15	10	10.2	se.	26	s.	24	7	6	18	7.0	.0	.0	2
Corpus Christi [1]	20	4	33	1,015.9	1,016.9	−1.4	65.1	+2.3	88	8	73	38	30	57	31	119	58	81	1.55	.....	.45	11	10.7	se.	28	e.	24	7	8	15	6.4	.0	.0	2
Dallas [1]	512	5	45	999.0	1,017.3	.....	58.2	+1.8	84	7	68	29	27	49	36	259	48	76	3.81	+1.3	2.44	9	10.1	s.	33	w.	25	8	10	12	6.0	.0	.0	2
Fort Worth [1]	679	35	56	993.2	1,017.6	−1.7	58.0	+3.5	83	7	67	32	27	50	30	260	48	73	3.82	+1.2	2.79	7	11.0	s.	34	sw.	25	7	8	15	6.4	.0	.0	1
Galveston [2]	54	100	114	1,015.6	1,017.6	−1.4	65.1	+1.8	79	8	70	46	27	61	16	109	58	80	2.02	−1.3	.78	11	10.6	se.	26	se.	24	8	7	15	6.3	.0	.0	0
Houston [2]	138	157	190	1,012.5	1,017.6	.....	62.7	+1.7	82	8	70	39	27	55	24	147	54	83	6.28	+2.4	2.56	12	10.1	se.	32	nw.	24	6	5	19	6.9	.0	.0	3
Palestine	510	64	72	1,000.3	1,018.3	−1.3	59.2	+2.0	80	1	67	36	27	51	29	229	50	77	7.59	+4.2	3.20	12	7.1	s.	22	se.	2	7	9	14	6.1	.0	.0	3
Port Arthur	34	59	134	1,016.3	1,017.6	.....	63.0	+1.9	80	8	70	38	27	56	22	148	54	86	6.29	+3.2	3.24	14	12.5	n.	35	s.	24	6	11	13	6.2	.0	.0	4
San Antonio [1]	693	8	51	992.6	1,017.3	−1.3	60.2	−.1	83	7	70	30	30	51	34	218	51	80	3.66	+1.8	1.31	9	8.4	ne.	34	nw.	24	7	4	19	7.2	.0	.0	5

See footnotes at end of table.

CLIMATOLOGICAL DATA WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
Ohio Valley and Tennessee	*Ft.*	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°F. 45.3	°F. +1.1	°F.		°F.	°F.		°F.	°F.		°F.	% 80	*In.* 2.24	*In.* −0.9	*In.*		*Mi.*								*0–10* 7.6	*In.*	*In.*	
Chattanooga [1]	762	6	66	991.5	1,019.6	−1.1	48.4	+.5	76	2	59	24	30	38	41	495	40	82	1.95	−1.4	1.26	6	7.1	n.	26	nw.	30	8	8	14	6.1	T	.0	0
Knoxville [1]	995	27	53	982.7	1,019.3	+.3	47.0	+.5	77	1	55	25	30	39	35	541	38	80	2.87	−.2	.91	7	6.2	ne.	24	sw.	9	6	8	16	6.8	T	.0	2
Memphis [4]	399	5	86	1,004.1	1,019.0	−1.0	52.0	+1.9	79	3	60	26	30	43	31	402	42	76	4.17	−.1	2.19	10	7.2	e.	21	nw.	23	8	8	14	6.4	T	.0	3
Nashville [1]	546	5	72	999.0	1,019.3	−.7	48.7	−.3	79	1	58	23	30	40	39	494	39	76	2.40	−1.1	1.10	9	8.0	s.	23	sw.	25	5	8	17	6.9	T	T	0
Lexington	989	4	28	982.7	1,020.3	+.3	43.8	−1.0	76	1	51	22	30	36	33	641	36	82	1.60	−1.7	.52	10	----	w.	----	----	----	2	10	18	7.8	T	T	1
Louisville [3]	525	106	120	999.7	1,019.3	−.7	47.2	+.5	78	1	54	22	30	41	30	537	36	73	1.51	−2.1	.65	8	8.7	w.	28	s.	8	1	11	18	8.0	T	.0	0
Evansville [1]	431	11	40	1,003.1	1,019.6	−.4	46.5	+2.1	78	2	54	21	30	39	32	558	37	74	1.67	−2.1	.51	9	8.4	w.	27	w.	30	2	6	22	8.3	T	.0	0
Indianapolis [1]	823	5	54	987.8	1,019.0	−.3	43.0	+2.3	77	1	50	20	30	36	27	660	36	82	2.19	----	.60	12	10.2	se.	31	w.	30	1	7	23	8.3	.4	T	1
Terre Haute [2]	575	68	149	997.6	1,019.3	----	45.4	+1.6	77	1	52	20	30	39	24	595	37	79	2.57	−.7	1.04	15	9.7	w.	25	w.	30	2	6	22	8.2	.8	.5	2
Cincinnati [3]	627	11	51	995.6	1,019.3	−.7	44.8	+2.3	77	3	52	22	30	38	30	611	36	80	2.71	−.1	.69	11	7.3	s.	21	w.	30	5	5	20	7.6	3.0	1.1	1
Columbus [3]	822	90	110	988.5	1,019.0	−.6	43.8	+1.9	74	3	50	22	30	38	24	637	36	80	1.54	−1.2	.48	13	8.9	s.	31	sw.	30	2	5	23	8.4	T	T	0
Dayton [1]	1,003	6	55	981.7	1,019.0	----	42.2	+1.8	75	1	49	20	30	35	30	685	35	80	1.89	−1.0	.64	14	10.9	nw.	34	w.	30	1	8	21	8.3	.2	.2	0
Elkins [1]	1,947	4	45	948.2	1,020.0	.0	40.0	+.7	70	8	50	17	30	43	34	750	34	88	2.34	−.4	.35	18	7.0	nw.	30	w.	30	5	2	23	7.8	3.7	1.6	1
Parkersburg	637	77	84	995.3	1,019.3	−.7	44.0	+.2	74	2	52	24	30	36	34	629	36	80	1.85	−.7	.44	13	6.4	se.	22	sw.	30	5	5	20	7.6	.5	.1	0
Pittsburgh [1]	842	39	54	986.8	1,018.3	−1.0	42.6	+1.4	72	1	49	19	30	36	26	668	36	82	2.35	+.1	.51	17	9.7	nw.	27	sw.	9	3	8	19	7.4	T	T	1
Lower Lakes							41.5	+2.9										81	2.35	−0.5											8.4			
Buffalo [1]	768	34	96	988.5	1,017.6	.0	42.0	+3.5	74	1	48	23	30	36	29	605	35	82	1.44	−1.6	.45	14	10.9	nw.	40	w.	30	3	4	23	8.4	3.9	2.0	0
Canton	448	10	61	1,000.0	1,016.9	----	36.4	+1.4	70	1	43	18	13	30	25	859	31	82	3.05	−.1	1.52	11	7.5	n.	21	e.	30	4	4	22	8.1	18.7	14.0	0
Oswego	335	71	85	1,004.1	1,016.9	−.7	40.6	+1.7	70	1	46	25	26	35	20	733	34	77	2.70	−.7	1.16	18	9.9	se.	29	n.	10	4	4	24	8.5	7.7	2.7	0
Rochester [1]	523	5	69	997.6	1,017.3	−.3	40.7	+4.0	76	1	47	24	30	34	29	726	34	84	2.29	−.2	.89	19	8.5	nw.	37	w.	30	2	4	24	8.3	25.4	17.0	0
Syracuse [1]	596	5	57	994.6	1,017.3	−.7	40.6	+3.4	71	2	47	26	20	34	26	734	34	83	4.23	+1.2	2.07	21	8.6	sw.	32	sw.	30	2	5	23	8.3	1.7	.2	3
Erie [2]	714	57	81	990.9	1,018.0	.0	44.9	+3.5	75	1	50	27	26	39	22	603	36	82	2.09	−1.2	.46	17	8.2	s.	26	w.	30	1	7	22	8.3	1.7	.2	1
Cleveland [1]	762	27	54	989.5	1,018.0	−.3	43.2	+4.2	74	1	50	22	30	36	30	656	34	78	1.85	−.8	.42	16	10.9	nw.	35	sw.	30	1	6	23	8.2	3.9	2.0	1
Sandusky	629	5	67	994.2	1,018.0	±.6	43.8	+2.7	76	1	50	24	30	38	23	636	----	----	2.28	−.1	1.18	11	9.0	w.	27	nw.	30	1	7	22	8.7	.3	.2	1
Toledo [1]	628	5	47	994.6	1,018.6	+.3	41.0	+2.3	76	1	48	21	6	34	28	719	34	82	1.82	−.6	.76	10	10.0	s.	28	sw.	30	0	6	24	8.9	T	T	2
Fort Wayne [1]	857	5	33	986.1	1,018.3	----	40.8	+2.0	75	1	47	21	6	34	28	724	36	86	2.50	−.4	.83	13	8.4	nw.	26	nw.	30	0	8	22	8.3	.7	T	1
Detroit [1]	730	5	78	990.9	1,018.6	+.6	42.6	+3.4	75	1	48	25	25	37	21	673	34	76	1.63	−.8	.67	11	9.4	nw.	29	nw.	30	1	4	25	8.8	T	T	0
Upper Lakes							39.0	+4.5										84	2.50	+0.1											8.7			
Alpena	609	5	89	994.9	1,018.0	+1.7	39.0	+4.6	70	1	43	21	30	35	23	778	34	87	3.25	+.6	.77	18	11.4	nw.	27	se.	26	2	4	24	8.6	9.0	6.0	0
Escanaba	612	51	72	994.9	1,018.3	+1.4	38.2	+5.1	60	2	43	21	6	34	25	800	34	86	2.89	+.8	.78	12	11.2	n.	34	n.	16	0	6	24	8.9	5.6	5.6	2
Grand Rapids [3]	707	70	244	991.2	1,017.6	.0	42.0	+3.6	77	1	48	22	30	37	23	693	34	83	1.61	−1.2	.45	14	9.2	se.	32	sw	1	1	4	25	8.5	4.9	3.0	1
Lansing [3]	878	5	90	985.1	1,018.0	----	39.6	+2.1	74	1	46	21	6	34	27	761	32	80	1.91	−.6	.55	13	7.8	s.	26	s.	2	2	5	23	8.3	2.4	.7	0
Marquette	734	44	73	989.8	1,018.0	+1.4	37.8	+4.5	73	1	42	21	30	34	27	814	34	88	4.41	+1.5	1.10	21	8.4	n.	26	sw.	2	1	1	28	9.4	11.8	9.8	0
Sault Sainte Marie [1]	614	11	52	995.3	1,018.6	+2.3	34.6	+4.2	64	1	40	15	30	29	23	913	30	86	3.28	+.3	.79	16	10.9	e.	28	n.	30	3	4	23	8.4	2.5	.4	0
Chicago [1]	673	5	36	992.6	1,018.0	−.3	42.7	+5.0	78	1	49	19	30	36	28	670	34	76	1.31	−1.2	.32	17	10.2	n.	27	nw.	30	2	6	22	8.3	1.0	.3	1
Green Bay	617	90	123	993.9	1,017.3	.0	40.3	+6.3	71	1	45	20	30	35	27	739	34	82	2.43	+.3	.82	12	9.8	se.	30	nw.	30	1	4	25	8.9	1.4	.7	2
Milwaukee [1]	681	33	66	991.9	1,017.3	−.3	41.4	+5.5	77	1	48	18	30	35	32	709	34	78	1.54	−.2	.46	13	12.4	nw.	36	sw.	2	2	2	26	8.7	.8	.8	5
Duluth [3]	1,133	5	47	974.9	1,017.3	.0	34.1	+4.1	61	2	38	4	30	30	27	924	30	92	2.40	+1.0	.59	17	11.2	ne.	33	nw.	26	2	1	27	9.2	4.1	1.3	2
North Dakota							28.0	+1.6										90	2.02	+1.4											8.3			
Fargo [1]	940	5	43	981.4	1,016.9	−1.4	32.9	+5.8	63	1	38	−1	30	28	21	965	30	92	1.85	+1.0	.60	12	11.9	n.	34	n.	29	2	2	26	8.8	5.3	4.1	1
Bismarck [1]	1,677	5	43	955.6	1,018.0	−.3	26.5	.0	64	1	33	−9	30	20	26	1,155	24	89	2.56	+2.0	.99	9	11.2	nw.	33	nw.	21	2	4	24	8.3	7.7	.8	0
Devils Lake	1,478	11	44	962.8	1,018.3	+.3	26.8	+2.3	57	1	31	−2	30	22	25	1,146	24	93	2.36	+1.6	1.02	13	9.6	n.	27	ne.	13	2	4	24	8.7	9.3	3.5	0
Grand Forks [1]	832	4	41	986.5	1,018.0	----	30.2	----	57	1	35	0	30	26	23	1,041	28	----	2.39	----	1.46	14	----	n.	----	----	----	3	3	24	----	3.4	2.4	1
Williston	1,878	42	50	948.9	1,018.3	+.3	25.6	−1.6	51	1	33	−1	030	19	29	1,181	22	87	1.33	+.8	.61	8	7.3	se.	25	nw.	21	4	8	18	7.4	7.3	1.9	0
Upper Mississippi							42.3	+4.2										81	1.86	−0.2											8.4			
Minneapolis-St-Paul [1]	919	43	74	982.1	1,016.6	−1.4	37.8	+5.4	75	1	43	9	30	33	29	819	32	84	2.10	+.8	1.41	14	11.1	se.	29	se.	1	0	6	24	8.7	2.5	1.2	4
Springfield, Minn.	1,025	4	42	978.3	1,016.6	----	36.4	----	73	1	42	3	30	31	32	860	32	----	1.56	----	.81	10	----	nw.	----	----	----	2	4	24	8.8	2.7	1.2	1
La Crosse [1]	714	5	29	989.8	1,016.6	−1.7	39.2	+5.5	73	1	45	18	29	34	24	774	34	84	.85	−.7	.30	14	8.7	se.	26	nw.	30	0	6	24	8.8	1.8	T	3
Madison [3]	974	70	78	981.0	1,017.3	−.7	40.2	+5.0	74	1	45	17	30	35	26	746	34	80	3.32	+1.5	1.42	11	8.4	se.	22	nw.	30	2	6	22	8.3	2.9	.9	3
Charles City	1,015	10	51	979.7	1,017.6	−1.0	38.8	+5.8	75	1	44	10	30	33	26	786	----	----	.77	−.8	.27	12	7.0	se.	20	s.	1	1	3	26	8.8	1.6	.9	2
Davenport [1]	606	6	50	995.3	1,018.0	−.6	42.5	+5.0	77	1	48	19	30	37	27	674	36	81	2.98	+1.2	1.16	12	10.1	nw.	31	nw.	30	1	5	24	8.6	.3	T	7
Des Moines [3]	860	5	99	984.8	1,016.6	−2.0	41.7	+3.3	76	1	47	13	30	36	23	698	34	82	1.18	−.2	.63	12	10.4	se.	27	se.	1	2	5	23	8.5	4.5	2.0	2
Dubuque	699	6	79	992.2	1,017.3	−1.0	40.6	+3.6	75	1	46	16	30	35	25	734	35	79	1.93	+.2	.82	12	5.9	nw.	17	se.	25	1	7	22	8.4	3.0	.5	3
Burlington [1]	702	4	36	991.5	1,018.0	−1.0	41.8	+3.2	76	2	48	15	30	36	25	699	36	82	2.74	+.7	.89	15	11.3	nw.	29	nw.	15	2	1	27	8.7	.2	T	5
Cairo	357	5	99	1,005.8	1,019.3	−.7	49.6	+2.3	77	2	56	23	30	43	26	470	----	----	2.60	−1.1	1.04	7	8.4	s.	28	s.	8	5	6	19	7.5	.0	.0	2
Peoria [1]	609	6	26	995.9	1,019.0	.0	43.0	+6.5	76	2	49	18	30	38	27	661	37	82	1.33	−1.0	.41	10	10.2	s.	26	s.	1	2	4	24	8.6	.3	T	3
Springfield, Ill. [3]	636	5	191	994.9	1,018.3	−1.0	45.2	+3.0	77	1	51	19	30	40	25	599	38	84	1.37	−1.2	.41	11	11.9	s.	27	s.	2	2	2	26	8.7	.5	.4	3
St. Louis [3]	568	35	303	997.3	1,018.6	−.7	46.8	+1.4	80	1	53	16	30	41	28	552	37	72	1.11	−1.7	.36	7	12.1	nw.	33	sw.	2	3	7	20	7.7	.3	T	2
Missouri Valley							41.6	+2.1										80	1.98	+0.5											7.6			
Columbia, Mo. [3]	784	6	66	988.8	1,017.6	−1.4	46.1	+2.0	79	1	53	14	30	39	28	579	38	78	1.83	−.4	.72	11	8.2	w.	21	s.	7	3	3	24	8.3	T.	.0	3
Kansas City [1]	963	39	76	981.4	1,016.9	−2.1	46.9	+3.2	78	1	54	12	30	40	33	556	37	71	2.94	+.7	1.92	9	11.5	nw.	34	sw.	7	5	7	18	7.3	T.	.0	2
St. Joseph [3]	967	11	49	981.4	1,016.9	----	44.8	+3.3	76	1	52	11	30	38	32	612	37	78	2.26	+.7	.83	9	10.0	nw.	27	w.	14	11	6	13	5.8	1.1	.1	1
Springfield, Mo [1]	1,324	5	67	969.9	1,018.0	−1.3	46.4	+1.4	76	1	54	16	30	39	29	558	38	80	1.80	−1.0	.87	11	11.9	s.	32	s.	24	4	7	19	7.3	T.	.0	5
Topeka	987	65	87	980.7	1,016.9	----	46.4	+3.6	79	13	54	11	30	39	28	565	37	75	2.24	+.7	.76	10	10.0	nw.	29	sw.	2	6	8	16	6.9	.2	.0	2
Lincoln [3]	1,189	11	81	972.9	1,016.6	−2.0	40.8	+1.7	77	1	48	5	30	33	28	731	32	80	2.57	+1.5	1.30	8	9.3	nw.	32	nw.	29	2	5	23	8.2	6.6	2.3	1
Omaha [1]	1,105	5	68	976.0	1,016.9	−1.7	40.4	+2.1	74	13	47	5	30	34	30	738	34	82	1.47	+.4	.80	5	12.0	nw.	33	nw.	15	1	4	25	8.6	5.0	3.1	1
Valentine	2,598	46	54	922.8	1,016.6	−2.0	33.6	−1.0	73	1	44	−1	30	24	36	945	26	78	2.81	+2.2	1.57	9	8.7	w.	32	nw.	14	4	11	15	7.0	3.6	2.6	0
Sioux City [1]	1,138	5	40	974.6	1,016.9	−1.7	37.2	+3.2	71	13	45	3	30	30	31	833	32	84	.65	−.4	.47	4	10.7	nw.	29	nw.	15	3	3	24	8.2	2.8	1.5	0
Huron [1]	1,301	5	41	968.5	1,016.9	−1.7	33.4	+1.9	71	1	41	−1	30	26	29	949	30	90	1.18	+.6	.71	10	12.1	nw.	37	se.	24	4	2	24	8.2	2.8	1.3	0

See footnotes at end of table.

CLIMATOLCGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	*°F.*	*°F.*	*°F.*		*°F.*	*°F.*		*°F.*	*°F.*		*°F.*	*%*	*In.*	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
Northern Slope							32.6	−0.7										79	1.06	+0.4											7.2			
Billings [1]	3,570	16	40	890.3	1,016.9	....	35.2	−.2	62	10	44	11	29	26	29	893	27	76	.29	....	.23	2	9.9	sw.	25	nw.	7	6	7	17	6.8	2.7	.0	0
Havre	2,507	11	67	926.5	1,018.6	+2.3	25.2	−6.0	57	8	33	−8	29	17	35	1,195	22	90	.54	−.1	.17	8	6.6	e.	27	sw.	8	3	8	19	7.8	5.6	1.6	0
Helena [1]	4,124	5	43	872.7	1,018.6	−.7	30.8	−1.0	56	9	41	5	20	21	32	1,026	24	77	.47	.0	.34	4	5.4	w.	27	w.	24	7	2	21	6.9	3.3	T	1
Missoula [1]	3,205	4	28	902.1	1,019.0	....	35.2	+1.6	54	5	42	19	21	29	23	896	30	86	.44	−.8	.24	6	5.0	se.	19	nw.	7	1	5	24	8.4	.8	.0	0
Kalispell	2,973	48	56	912.0	1,016.9	−1.4	33.4	+1.0	52	7	38	19	14	29	23	945	30	86	1.47	+.1	.72	14	4.0	w.	17	n.	11	0	2	28	9.3	10.2	1.0	1
Miles City [1]	2,371	5	78	931.9	1,018.6	+.3	30.1	....	59	1	39	−2	29	22	31	1,045	26	88	.35	....	.16	4	....	....	....	....	....	5	5	20	7.5	1.4	.0	0
Rapid City [1]	3,259	5	63	900.1	1,016.9	−1.7	33.0	−1.6	69	11	42	1	29	24	37	961	26	83	2.09	+1.6	1.09	5	15.6	nw.	54	nw.	14	6	10	14	6.5	9.7	.0	1
Cheyenne [1]	6,094	5	40	810.4	1,015.9	−2.4	35.8	+1.0	64	9	49	4	26	22	44	875	20	58	.90	+.4	.88	4	11.3	nw.	42	nw.	13	8	9	13	6.1	6.7	2.1	1
Lander	5,352	60	68	833.7	1,019.0	−.3	25.4	−4.9	61	5	36	−3	20	15	32	1,189	18	74	1.46	+.9	.87	3	3.9	sw.	27	sw.	1	7	10	13	6.3	16.5	8.6	0
Sheridan [1]	3,790	5	38	883.2	1,017.3	....	34.4	+1.7	60	5	45	11	17	23	34	919	26	78	1.11	+.5	.41	7	6.9	nw.	38	nw.	14	7	4	19	6.9	7.6	.9	0
North Platte [1]	2,821	11	51	915.0	1,015.9	−2.7	37.6	+1.0	76	1	49	1	30	26	42	824	27	77	1.08	+.6	.77	7	7.5	nw.	24	w.	13	6	3	21	7.5	4.0	1.5	0
Middle Slope							45.8	+2.3										69	1.52	+0.4											6.0			
Denver [1]	5,292	106	113	835.4	1,014.9	−3.1	42.0	+2.2	73	10	53	13	30	31	36	688	22	54	.44	−.1	.36	6	7.0	s.	27	n.	24	7	12	11	5.4	4.3	T	1
Pueblo [1]	4,690	5	36	855.1	1,015.9	−1.7	39.8	+1.5	72	11	55	6	26	24	49	759	20	52	.19	−.2	.19	1	7.5	w.	45	n.	25	10	7	13	5.5	T	T	1
Concordia	1,392	50	58	965.8	1,016.6	−2.0	43.2	+1.8	76	1	52	9	30	34	36	653	34	76	1.94	+1.0	1.36	6	8.6	nw.	26	nw.	15	5	8	17	7.0	T	.0	1
Dodge City [1]	2,509	5	58	926.5	1,015.6	−2.7	44.4	+1.8	80	1	56	10	30	33	41	621	33	72	.93	+.2	.59	7	14.6	nw.	45	nw.	25	12	5	13	5.5	.1	.0	1
Wichita [1]	1,358	6	64	967.2	1,015.9	−3.0	47.5	+2.7	78	1	55	15	30	40	30	525	39	76	1.93	+.5	.54	8	14.6	nw.	43	s.	1	9	5	16	6.3	T	.0	3
Oklahoma City [2]	1,214	10	47	972.9	1,016.9	−1.7	52.0	+3.2	80	1	60	21	30	44	29	404	42	76	2.39	+.5	.99	6	9.2	s.	24	s.	1	10	6	14	5.7	.0	.0	3
Tulsa [1]	674	10	60	992.2	1,016.6	....	51.8	+2.9	79	1	60	20	30	43	34	413	42	74	2.84	+.7	.86	9	11.4	se.	45	sw.	13	7	10	13	6.5	.0	.0	4
Southern Slope							53.3	+2.2										70	0.88	−0.2											5.5			
Abilene [1]	1,738	4	59	955.0	1,016.3	−2.0	56.0	+3.4	85	13	66	27	30	40	38	314	45	74	1.37	.0	.52	7	12.4	s.	37	sw.	25	8	9	13	5.8	.0	.0	1
Amarillo [1]	3,676	5	42	888.9	1,015.9	−1.7	47.2	+3.4	81	1	59	15	30	38	43	537	32	68	.75	−.2	.36	4	13.9	sw.	44	nw.	25	12	6	12	5.4	1.0	.0	2
Del Rio	960	63	71	982.1	1,015.9	−1.7	61.2	+1.2	83	7	70	33	27	53	33	190	50	72	1.15	−.1	.88	6	8.1	se.	27	nw.	8	8	7	15	6.3	.0	.0	1
Roswell	3,566	75	85	893.0	1,015.9	−1.0	48.7	+.6	80	1	62	20	29	35	47	485	35	64	.26	−.6	.14	5	7.1	s.	34	w.	6	14	9	7	4.5	.0	.0	0
Southern Plateau							50.6	−1.3										64	1.18	+0.5											4.7			
El Paso [1]	3,778	39	85	885.9	1,014.6	−1.3	51.4	+.3	82	4	63	27	29	40	32	412	34	56	.41	−.1	.27	4	9.8	n.	54	w.	25	13	10	7	4.5	T	.0	0
Albuquerque [1]	5,314	5	45	837.5	1,014.9	....	43.0	−.3	72	4	54	20	29	32	34	660	28	58	.56	+.1	.45	4	9.7	se.	52	s.	5	9	11	10	5.4	T	.0	2
Flagstaff	6,907	36	51	788.7	1,017.3	−.7	35.0	−2.2	66	2	47	6	25	23	36	901	24	69	1.96	+.7	.69	10	....	nw.	....	....	....	....	10	8	12	....	9.7	T	2
Phoenix [2]	1,107	39	87	974.9	1,013.9	−1.3	58.0	−1.7	86	3	70	33	26	46	33	234	43	70	1.13	+.4	.39	8	5.6	e.	31	w.	12	11	13	6	4.9	.0	.0	2
Tucson [1]	2,555	5	39	925.2	1,013.5	....	55.9	−1.8	87	4	68	31	26	43	33	287	40	66	1.78	+1.0	.64	8	....	se.	....	....	....	....	12	11	7	4.8	.0	.0	2
Yuma	142	9	54	1,009.1	1,013.5	−1.7	60.2	−2.2	86	3	71	38	26	49	31	167	46	64	1.22	+.9	.39	7	4.9	n.	23	w.	5	17	7	6	3.7	.0	.0	3
Middle Plateau							37.0	−2.0										73	1.59	+0.9											5.2			
Reno [1]	4,527	20	52	861.8	1,016.9	−2.7	38.1	−1.6	67	3	50	16	25	26	42	804	28	70	1.58	+.9	.73	8	6.1	nw.	43	s.	3	8	10	12	6.2	1.3	.0	0
Tonopah	6,090	9	20	812.1	1,015.2	....	34.6	−6.6	60	2	42	17	15	28	22	909	27	74	1.67	+1.4	1.03	5	....	w.	....	....	....	8	10	12	....	6.1	.0	0
Winnemucca	4,339	5	56	867.9	1,018.3	−2.4	34.0	−4.4	58	1	42	13	25	26	32	932	28	82	1.78	+1.1	.52	11	7.5	ne.	29	s.	10	3	11	16	7.5	6.0	T	0
Modena	5,473	10	46	832.7	1,015.6	−3.0	35.6	−.8	67	3	46	13	26	25	40	886	....	....	2.09	+1.5	.86	6	8.5	sw.	28	s.	4	12	9	9	5.3	5.0	.0	0
Salt Lake City [1]	4,227	32	58	867.6	1,018.0	−2.0	38.4	−1.0	64	3	46	12	25	30	28	797	30	76	1.44	+.3	.54	8	7.9	s.	34	s.	12	8	2	20	6.9	6.2	T	0
Grand Junction	4,602	60	68	859.5	1,015.2	−3.4	41.5	+2.2	70	4	51	18	26	32	29	707	28	61	.98	+.4	.58	9	5.4	se.	27	s.	5	9	12	9	5.5	T	.0	1
Northern Plateau							37.0	−1.3										82	1.42	0.0											8.1			
Baker [2]	3,471	36	54	895.7	1,018.6	−2.7	34.8	−1.2	56	5	42	14	28	27	27	907	28	82	1.01	.0	.65	8	5.3	se.	17	sw.	1	3	8	19	7.7	3.3	.0	0
Boise [1]	2,739	5	49	921.4	1,019.0	−2.7	38.7	−1.0	59	3	45	22	28	32	20	786	32	77	1.60	+.3	.52	10	8.9	se.	33	w.	4	1	7	22	8.4	T	T	1
Pocatello [1]	4,478	5	31	862.9	1,019.6	−1.1	32.5	−1.6	55	9	40	8	29	26	28	976	27	82	1.82	+.8	.59	12	7.6	sw.	34	s.	10	2	5	23	8.5	6.2	.5	0
Spokane [1]	1,929	27	42	947.5	1,017.6	−1.7	36.8	−1.7	54	8	42	19	17	31	23	846	32	85	1.64	−.4	.56	13	5.1	ne.	21	s.	23	2	4	24	8.6	3.9	T	0
Walla Walla	991	57	65	981.4	1,017.6	−2.7	40.8	−2.0	64	8	47	22	16	35	23	729	....	....	1.16	−.9	.42	13	4.9	sw.	22	w.	23	2	5	23	8.1	.0	.0	0
Yakima	1,076	58	67	977.7	1,016.9	....	38.4	−.5	58	5	45	23	16	31	26	802	....	....	1.28	+.4	.78	12	3.7	nw.	15	sw.	1	4	10	16	7.3	.7	.0	0
North Pacific Coast							46.7	+0.7										82	6.68	+0.3											7.9			
North Head	211	5	55	1,005.4	1,012.9	−4.7	48.6	+.4	58	4	53	38	15	44	20	493	43	81	10.82	+2.4	2.52	20	16.5	e.	54	s.	7	2	3	25	8.3	.0	.0	0
Seattle [1]	125	90	321	1,009.5	1,013.5	−3.8	47.8	+1.0	61	2	53	32	16	42	20	515	40	83	4.44	−.6	1.01	18	9.3	se.	35	s.	23	2	6	22	8.3	.0	.0	0
Tacoma	194	172	201	1,006.8	1,013.5	−3.8	46.0	+1.4	60	22	52	32	28	40	20	568	....	....	4.67	−1.6	1.02	18	7.2	s.	30	sw.	23	4	7	19	7.4	.0	.0	1
Tatoosh Island	86	9	61	1,008.5	1,011.2	−3.7	48.7	+2.8	56	3	52	43	29	46	10	489	44	84	13.44	+1.5	2.35	22	18.7	e.	56	e.	3	1	4	25	8.7	.0	.0	1
Medford [1]	1,329	29	58	968.2	1,016.6	....	43.2	−.7	61	3	53	22	19	34	32	654	36	80	3.14	+.8	.76	13	....	nw.	....	....	....	4	9	17	7.3	.0	.0	0
Portland, Oreg. [2]	154	68	106	1,009.8	1,015.2	−4.1	47.2	+.4	59	4	52	33	15	43	18	535	40	82	5.80	−.3	1.92	16	7.0	e.	18	sw.	26	4	10	16	6.8	.0	.0	0
Roseburg	510	45	76	997.3	1,015.9	−4.1	45.2	−.7	62	3	52	31	15	39	21	594	40	84	4.45	−.2	.99	15	3.3	s.	16	sw.	23	0	5	25	8.4	.0	.0	0
Middle Pacific Coast							52.6	−1.1										79	6.30	+3.2											6.0			
Eureka	60	72	88	1,014.2	1,016.3	−3.3	52.0	+.9	66	28	58	38	14	46	21	389	46	82	9.11	+3.9	1.90	18	6.6	se.	30	nw.	8	10	2	18	6.2	.0	.0	0
Red Bluff [1]	....	6	26	1,003.7	1,015.9	....	50.8	−3.0	69	21	59	34	17	43	32	424	42	72	5.98	....	1.25	14	8.4	nw.	30	se.	8	8	5	17	6.6	.0	.0	0
Sacramento	66	92	115	1,014.2	1,016.3	−2.7	51.7	−1.9	69	1	59	37	21	44	24	403	44	81	3.54	+1.7	.87	12	6.4	se.	21	s.	3	10	4	16	6.1	.0	.0	1
San Francisco [2]	155	112	132	1,010.8	1,015.9	−3.1	55.7	−.6	66	22	60	48	28	51	17	273	48	82	6.24	+3.9	1.53	12	6.6	n.	20	sw.	10	8	10	12	5.7	.0	.0	0
South Pacific Coast							56.7	−0.8										73	3.34	+2.4											5.6			
Fresno [1]	327	5	34	1,004.4	1,016.3	−1.7	51.4	−1.0	74	3	60	34	25	42	27	407	46	80	1.37	+.4	.58	7	4.2	se.	19	nw.	24	5	10	15	6.7	.0	.0	0
Los Angeles	338	223	250	1,003.7	1,015.2	−1.4	59.0	−1.9	77	22	67	46	19	51	24	182	45	65	3.72	+2.5	1.39	8	6.8	w.	27	e.	13	13	8	9	4.7	.0	.0	3
San Diego [1]	87	20	55	1,012.5	1,015.2	−1.4	59.8	+.5	72	22	68	44	26	51	27	157	50	74	4.93	+4.2	2.44	8	5.9	w.	37	sw.	11	10	8	12	5.4	.0	.0	1
West Indies																																	
San Juan, P. R.	82	10	54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Panama Canal																																	
Balboa Heights	118	6	92	....	[3]1,009.5	0.0	79.6	+.6	91	26	86	70	15	73	17	0	74	[3]88	7.76	−2.4	....	20	5.2	nw.	20	nw.	6	0	17	13	7.0	.0	.0	5
Cristobal	27	47	97	....	[3]1,009.8	−.4	80.2	+.8	89	3	85	71	16	76	15	0	74	[3]83	16.41	−5.8	....	23	9.6	ne.	31	ne.	30	3	15	12	6.7	.0	.0	3

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS—Continued

District and station	Elevation of instruments: Barometer above sea level	Thermometer above ground	Anemometer above ground	Pressure: Station	Sea level	Departure from normal	Temperature of the air: Mean	Departure from normal	Maximum	Date	Mean maximum	Minimum	Date	Mean minimum	Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Departure from normal	Greatest in 24 hours	Day	with 0.01 inch or more	Wind: Average hourly velocity	Prevailing direction	Maximum velocity: Miles per hour	Direction	Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
Alaska	*Ft.*	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°F.	°F.	°F.		°F.	°F.		°F.	°F.		°F.	%	*In.*	*In.*	*In.*			*Mi.*								*0–10*	*In.*	*In.*	
Anchorage [1]	132	5	44	997.3	1,002.4	-----	22.4	+.1	49	16	30	−10	13	15	30	1,276	20	81	.33	−.7	.25	5		4.8	ne.	22	s.	16	6	5	19	7.1	5.4	1.5	0
Fairbanks [1]	455	5	63	991.5	1,009.5	-----	4.4	+1.0	30	1	14	−26	13	−5	31	1,817	3	85	.21	−.5	.12	6		4.4	n.	14	n.	8	8	3	19	6.5	4.1	4.8	0
Juneau [1]	80	6	32	1,001.7	1,004.7	-----	34.1	-----	48	15	39	20	11	30	16	925	32	88	7.52	-----	-----	16		6.5	n.	34	se.	20	1	6	23	8.5	16.7	2.0	0
Nome	43	25	56	1,008.8	1,009.5	-----	14.4	−1.5	31	1	20	−10	25	8	24	1,580	10	74	.41	−.6	-----	5		9.7	ne.	37	ne.	13	9	8	13	5.7	4.4	1.3	0
Bethel	28	7	31	1,002.4	1,003.7	-----	13.8	−3.2	36	18	20	−10	25	8	20	1,540	13	89	1.09	+.2	-----	11		10.7	n.	31	-----	13	4	8	18	7.1	6.4	4.7	0
Gambell	32	5	32	1,010.5	1,011.9	-----	18.0	−5.2	34	12	21	−1	28	15	15	1,410	16	88	.52	−.5	-----	12		28.0	nne.	62	nne.	15	4	3	23	8.0	5.2	3.4	0
Ketchikan	75	69	90	1,005.1	1,006.1	-----	42.8	−2.6	53	15	47	30	27	38	15	665	39	84	16.02	−4.2	3.07	21		7.4	ne.	34	s.	14	2	3	25	8.7	T	.0	0
Kotzebue	20	5	31	1,013.2	1,013.5	-----	2.8	−3.0	21	4	9	−23	26	−3	21	1,869	0	84	.13	−.2	-----	2		10.0	ne.	38	e.	10	13	9	8	4.4	2.1	6.5	0
McGrath	331	5	31	993.9	1,007.1	-----	5.4	-----	28	1	12	−32	30	−2	29	1,788	4	86	.62	-----	.20	12		----	nw.	---	-----	---	5	6	19	7.6	10.4	9.4	0
Northway	1,718	5	32	945.8	1,011.5	-----	.5	-----	28	1	7	−42	13	−6	28	1,931	0	87	.27	-----	.09	8		3.0	s.	14	-----	8	1	4	25	8.5	6.1	8.0	0
Summit	2,405	5	30	916.4	1,006.1	-----	11.0	-----	40	15	17	−17	12	5	57	1,618	8	82	1.32	-----	.87	7		----	ne.	---	-----	---	9	10	11	5.7	16.3	31.7	0
Hawaii																																			
Honolulu	38	86	100	1,015.2	1,015.9	-----	75.6	+1.1	81	1	80	65	26	72	15	0	----	---	1.06	−2.8	.64	16		10.1	e.	21	ne.	3	14	12	4	4.4	.0	.0	1
LATE REPORTS FOR OCTOBER, 1944																																			
Alaska																																			
Bethel	28	7	31	1,002.0	1,003.7	-----	32.4	+.9	48	2	37	13	27	28	21	1,009	30	85	2.09	+.4	-----	18		12.8	n.	31	-----	20	2	7	22	7.7	.9	.1	0
Gambell	32	5	32	1,006.8	1,007.8	-----	31.3	−.3	46	2	34	23	11	28	13	1,045	28	80	1.03	−.6	-----	13		21.0	n.	59	s.	22	2	4	25	8.0	2.1	.0	0
Ketchikan	75	69	90	1,010.8	1,011.5	-----	50.8	+4.1	64	10	56	36	20	46	21	442	46	84	34.27	+14.2	6.77	24		8.0	se.	34	s.	26	3	3	25	8.5	.0	.0	0
Kotzebue	20	5	31	1,005.1	1,005.4	-----	26.7	+2.0	43	2	31	1	27	22	22	1,187	24	86	1.22	+.7	-----	11		13.0	ne.	43	se.	22	5	7	19	7.0	8.8	4.7	0
McGrath	331	5	31	991.5	1,004.4	-----	30.0	-----	47	3	36	1	29	24	19	1,085	26	82	1.31	−.4	-----	9		----	n.	---	-----	---	1	3	27	9.0	8.7	2.6	0
Northway	1,718	5	32	944.1	1,008.1	-----	26.2	-----	48	10	33	−5	28	20	24	1,203	22	82	.57	-----	.22	11		4.6	e.	28	-----	24	1	7	23	8.4	11.5	6.4	0
Summit	2,405	5	30	917.7	1,005.8	-----	26.6	-----	42	2	32	3	28	21	22	1,188	24	86	2.58	-----	.67	18		----	e.	---	-----	---	2	9	20	7.7	36.1	24.2	0

[1] Data are airport records.
[2] Barometric data (adjusted to old city elevation) and hygrometric data from airport; otherwise city office records.
[3] Observations taken hourly.
[4] Pressure (adjusted to old city elevation), temperature, and hygrometric data from airport; otherwise city office records.
[5] Temperature and precipitation from city records, other data from airport.

NOTE.—Except as indicated by notes 1, 2, 4, and 5 data in table are city office records.

SEVERE LOCAL STORMS, NOVEMBER 1944

[Compiled by Mary O. Souder]

[The table herewith contains such data as has been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the United States Meteorological Yearbook]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks
Pomona, Calif., southeast portion.	*Nov.* 11	9 p.m., P.W.T.	50	0	$50,000–100,000	Mild tornado	Storm had many of the characteristics of a tornado and could probably be classified as a mild one. Storm originated 2 miles southeast of the center of Pomona. Trees uprooted, buildings overturned or demolished. On 1 ranch the front porch of the main house was demolished by a falling tree, several outbuildings blown over or destroyed, and numerous walnut trees uprooted. At still another place on the same ranch 2 barns, 1 old and 1 comparatively new, were destroyed, but a lean-to between the 2 barns was unharmed and a pile of turkey feathers 30 feet to the west of 1 of the barns was not disturbed. About one-half mile east-northeast of this ranch, walnut trees on a 4-acre plot were uprooted and about 2½ miles east-northeast a long garage, opening to the south, was blown over and the other half unharmed. The 250-pound concrete block on which the garage had been resting was carried 26 feet. At another point 1 orange tree in the center of a large grove was twisted off at the trunk, but none of the nearby trees were damaged. Elsewhere along the storm path the damage was confined almost entirely to uprooted trees, most of them large walnut or shade trees which had rather shallow roots. Path 8 miles long.
South Dakota, western portion.	13–14	-----	-----	-----	-----	Wind and snow	Snowfall of from 6 to 24 inches blocked highways in the Black Hills area so transportation was at standstill and some schools closed.
Collinsville, Okla.	25	4:13 p. m.	200	0	35,000	Tornado	About 25 houses damaged or destroyed; 5 persons injured; path 1½ miles long.
Raton, N. Mex.	25	-----	-----	-----	10,000–15,000	Wind	Property damaged. Wind velocity recorded at 47 miles per hour at the airport and 90 miles in the city.
New York State	29–30	-----	-----	-----	750,000	Snow	Heavy snow fell in central and northern portions of the State reaching a depth in excess of 2 feet at Syracuse which was the area of the greatest fall. Motor traffic was stalled on all highways radiating from the city. In some northern areas there were drifts of from 6 to 7 feet deep. Communication and electric power transmission lines were broken. Damage estimated to telephone lines alone.
Rhode Island, southern portion, to Calais, Maine.	30	p. m.	-----	0	-----	Gale and heavy rain	The storm swept up the coast from Hatteras, struck Rhode Island savagely, did heavy damage to Cape Cod and Boston's north shore, then dashed against a 15-mile stretch of the Maine shore in what observers called the worst storm in half a century. It was the third bad storm in as many months. Train service on the New Haven R. R., threatened by high water at bridges along the shore route to New York, but no trains were canceled. Rampant surface water and record-breaking tides at noon along the New Hampshire and Maine coasts disrupted Boston and Maine R. R. schedules. A 14-foot tide inundated most Boston wharves along Atlantic Avenue and South Boston waterfront compelling personnel of business firms to vacate first-floor locations. Autoists forced to detour the Fox Hill Bridge connecting Lynn and Saugus and scores of cellars along Surfside Road, East Lynn, were flooded. Much of the damage on Cape Cod to homes that had just been repaired after the recent hurricane. Entire loss of this storm estimated to be millions of dollars.

SOLAR RADIATION AND SUNSPOT DATA FOR NOVEMBER 1944

[Solar Radiation Investigations Section, I. F. Hand, in charge]

SOLAR RADIATION OBSERVATIONS

EXPLANATIONS of the tables and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the January 1944 REVIEW, page 43. A list of the pyrheliometric stations also is given on page 45 of the same REVIEW.

TABLE 1.—*Solar radiation intensities during November 1944*

GRAM-CALORIES PER MINUTE PER SQUARE CENTIMETER OF NORMAL SURFACE

Madison, Wis.

Date	Sun's zenith distance: 7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass: A. M.				*1.0	P. M.				Local mean solar time
	e	5.0	4.0	3.0	2.0		2.0	3.0	4.0	5.0	e
	mb.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*
Nov. 24	4.2	0.54	0.32	0.44							4.8
Means		(.54)	(.32)	(.44)							
Departures		−.33	−.67	−.70							

Lincoln, Nebr.

Nov. 9	6.6	0.83	1.07	1.22	1.36		1.34	1.20	1.07	0.96	6.6
Nov. 18	3.5	.39	.45	.62							6.1
Nov. 23	5.8	1.01	1.09	1.22				1.18	1.07	.98	6.1
Nov. 29	3.5	.92	.94								3.8
Means		.79	.89	1.02	(1.36)		(1.34)	(1.19)	(1.07)	(.97)	
Departures		−.10	−.12	−.15	.00		.00	+.01	+.04	+.05	

Blue Hill, Mass.

Nov. 1	11.0							0.79	0.64	0.57	11.8
Nov. 3	12.3	0.88	0.98	1.11	1.25		1.14	.95	.77	.64	11.4
Nov. 4	11.8	.64	.76	.93	1.18					.84	10.2
Nov. 5	11.8						1.24	1.07			6.9
Nov. 6	6.0	.95	1.03	1.19	1.30		1.34				6.6
Nov. 12	3.8	.93	1.01	1.17	1.34		1.36	1.22	1.11	1.01	4.0
Nov. 13	3.5	1.03	1.12		1.30			1.21	1.04	1.00	3.8
Nov. 14	3.2		1.06	1.18				1.15	.99	.91	4.0

TABLE 1.—*Solar radiation intensities during November 1944*—Con.

Blue Hill, Mass.—Continued

Date	Sun's zenith distance: 7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass: A. M.				*1.0	P. M.				Local mean solar time
	e	5.0	4.0	3.0	2.0		2.0	3.0	4.0	5.0	e
	mb.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*
Nov. 19	3.8	.97	1.06								4.6
Nov. 25	3.8			1.19	1.30			1.20	1.07	.98	3.8
Nov. 26	3.5	1.04	1.15	1.33							3.8
Nov. 28	8.7									.78	6.6
Means		.92	1.02	1.16	1.29		1.27	1.08	.94	.84	
Departures		+.01	+.01	+.03	+.02		+.01	−.02	−.02	.00	

Albuquerque, N. Mex.

Nov. 2	5.4							1.14	1.06	1.00	6.0
Nov. 3	4.4	0.78	0.87	1.00	1.15		1.24	1.18	1.11		6.0
Nov. 4	4.2	.86		1.06	1.20		1.21	1.11			6.3
Nov. 7	4.2	.93	1.02	1.12	1.25						4.4
Nov. 9	4.0	.96	1.04	1.15			1.26		1.14	1.08	4.4
Nov. 10	3.8	.90	1.00	1.10	1.25		1.32	1.27	1.23	1.17	4.8
Nov. 11	3.8	.90	.99	1.11							4.2
Nov. 13	4.2		1.09	1.17	1.31		1.34				3.8
Nov. 14	3.2	.90	.99	1.09	1.26		1.29	1.19	1.17	1.15	3.2
Nov. 20	2.7	.83		1.06				.93		.65	3.6
Nov. 21	2.7	.92	1.01	1.13	1.28			1.14	1.06	.95	3.6
Nov. 22	2.2	1.05	1.14	1.22	1.32		1.25				3.0
Nov. 23	2.3			1.10	1.16		1.26	1.17	1.07		3.0
Nov. 26	3.4	1.04	1.13	1.27	1.38		1.43	1.34	1.32	1.28	3.0
Nov. 28	2.4	.96	1.14	1.24	1.41			1.42	1.34	1.32	2.9
Means		.92	1.04	1.13	1.27		1.29	1.19	1.17	1.08	
Departures		−.08	−.08	−.09	−.09		−.08	−.05	+.05	+.07	

Boston, Mass.

Nov. 7	4.4	0.84	0.86	1.09	1.14	1.19	1.12	0.98	0.81		4.8
Nov. 13	4.0		.75				1.19	1.14	.95	0.94	4.4
Nov. 14	3.7	.60	.90	.83	1.15		1.14	1.05	1.06		5.1
Nov. 24	3.8	.71	.92	1.09	1.18						5.6
Nov. 28	8.5						1.09	.86	.73	.62	6.9
Means		.72	.86	1.00	1.16	(1.19)	1.14	1.01	.89	(.78)	

Ratio: Boston-Blue Hill on comparable dates

			0.75	0.70				0.93	0.98	0.88	

*Extrapolated.

TABLE 2.—*Daily totals and weekly means of solar radiation (direct+diffuse) received on horizontal surface*

[Gram-calories per square centimeter]

Date	Washington, D. C.	Madison, Wis.	Lincoln, Nebr.	East Lansing, Mich.	New York, N. Y.	Fresno, Calif.	Fairbanks, Alaska	Columbia, Mo.	Boston, Mass.	Nashville, Tenn.	Twin Falls, Idaho	La Jolla, Calif.	Riverside, Calif.	Blue Hill, Mass.	Ithaca, N. Y.	Newport, R. I.	State College, Pa.	Put-in-Bay, Ohio	East Wareham, Mass.	Davis, Calif.	Boulder, Colo.	Tooele, Utah	Illumination—Boston, Mass.
1944	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*Avg. ft. candles*
Oct. 29	336	291	298	282	352	315	55	319	220	329	229	114	349	236	186	296	344	335	253	331	298	292	1,904
Oct. 30	308	217	303	238	192	226	50	233	263	270	218	102	226	313	72	309	262	305	238	98	206	327	2,157
Oct. 31	285	257	323	183	251	130	68	281	201	158	135	------	136	263	283	259	269	284	294	260	284	102	1,723
Nov. 1	243	257	190	206	203	306	14	186	202	283	215	------	271	240	246	251	266	243	294	275	305	316	1,793
Nov. 2	191	46	121	146	188	345	46	193	185	305	182	------	325	254	258	249	268	232	290	109	286	357	1,646
Nov. 3	169	145	250	119	226	317	72	58	184	321	92	------	350	266	273	256	270	251	302	93	279	295	1,569
Nov. 4	124	249	289	73	150	113	64	331	211	88	55	------	184	261	143	254	130	97	287	269	226	95	1,762
Mean	**236**	**209**	**253**	**178**	**223**	**250**	**53**	**229**	**209**	**250**	**161**	------	**263**	**262**	**208**	**268**	**258**	**250**	**294**	**205**	**269**	**255**	**1,793**
Departure	**−10**	**+24**	**+19**	**+33**	**+10**	**−77**	**+7**	------	------	**+31**	**−50**	------	**−46**	**+42**	**+47**	**+38**	**+80**	**+65**	**+83**	**−90**	------	------	------
Nov. 5	141	228	30	154	177	135	83	112	143	323	86	------	123	193	63	230	106	66	142	358	205	69	1,229
Nov. 6	155	137	203	272	216	312	13	242	21	327	250	------	276	27	42	39	88	247	56	112	128	111	285
Nov. 7	258	189	117	74	267	246	27	155	244	271	187	------	295	278	148	270	271	114	296	245	275	202	2,046
Nov. 8	273	183	60	36	218	334	15	118	135	175	255	------	361	132	45	191	182	161	121	184	322	337	795
Nov. 9	212	42	323	47	149	139	24	72	63	105	49	------	261	137	100	116	134	51	161	54	274	164	622
Nov. 10	130	55	217	26	20	181	24	152	12	239	54	------	90	18	55	29	74	80	38	289	322	197	171
Nov. 11	282	65	289	41	260	67	22	293	62	277	88	------	119	78	49	114	218	46	85	63	282	139	693
Mean	**207**	**128**	**177**	**93**	**187**	**202**	**30**	**164**	**97**	**245**	**138**	------	**218**	**123**	**71**	**141**	**153**	**109**	**128**	**186**	**258**	**174**	**834**
Departure	**−15**	**−33**	**−50**	**−14**	**+2**	**−90**	**−8**	------	------	**+40**	**−70**	------	**−77**	**−62**	**−73**	**−60**	**−4**	**−36**	**−62**	**−69**	------	------	------
Nov. 12	283	203	81	133	292	161	30	204	241	297	56	------	187	276	185	273	287	73	296	215	249	76	2,067
Nov. 13	267	181	236	170	240	168	------	148	235	186	92	------	158	272	201	264	290	212	280	120	272	197	1,957
Nov. 14	186	103	138	36	244	202	6	293	209	84	108	------	114	255	236	246	267	61	272	327	196	303	1,787
Nov. 15	147	76	71	125	63	287	3	38	96	258	154	------	297	112	22	101	66	162	109	327	148	323	946
Nov. 16	157	107	62	50	22	272	12	37	14	199	107	------	285	32	22	14	46	50	37	323	190	324	148
Nov. 17	23	176	69	52	91	304	21	26	36	68	64	275	311	36	56	85	26	55	97	285	244	315	515
Nov. 18	94	163	160	130	176	154	5	38	77	119	32	293	271	96	131	192	76	95	161	195	209	320	854
Mean	**165**	**144**	**117**	**99**	**161**	**221**	**13**	**112**	**130**	**173**	**88**	------	**232**	**154**	**122**	**168**	**142**	**101**	**179**	**256**	**216**	**266**	**1,182**
Departure	**−36**	**−10**	**−91**	**−1**	**+11**	**−28**	**−13**	------	------	**−29**	**−76**	------	**−41**	**−8**	**+9**	**−22**	**−8**	**−27**	**+3**	**+21**	------	------	------
Nov. 19	162	170	43	60	192	209	27	92	188	17	49	305	288	228	72	234	64	66	171	304	206	271	1,713
Nov. 20	29	85	42	70	27	277	2	43	115	6	38	310	329	130	46	104	36	19	100	276	279	112	1,179
Nov. 21	165	73	31	85	18	260	14	64	7	75	46	305	339	6	36	15	70	112	21	303	266	174	90
Nov. 22	105	63	160	81	86	264	8	190	15	57	138	292	325	27	92	40	144	121	71	276	202	255	240
Nov. 23	122	71	273	103	194	265	7	271	75	215	174	183	304	116	169	235	130	38	204	248	252	319	758
Nov. 24	150	226	141	100	189	285	20	100	39	216	213	162	316	85	42	220	80	225	178	302	120	163	425
Nov. 25	231	86	7	93	252	250	15	21	192	3	200	287	339	224	76	230	225	48	252	249	160	331	1,093
Mean	**138**	**111**	**100**	**85**	**137**	**259**	**12**	**111**	**90**	**88**	**123**	**263**	**320**	**117**	**75**	**154**	**107**	**90**	**144**	**280**	**212**	**232**	**871**
Departure	**−46**	**−20**	**−95**	**−22**	**−4**	**+20**	**−4**	------	------	**−90**	**−35**	**−33**	**+43**	**−31**	**−44**	**−4**	**−28**	**−28**	**−11**	**+60**	------	------	------
Nov. 26	228	57	88	32	190	102	−15	26	190	32	52	264	227	220	206	234	219	54	264	89	254	168	1,623
Nov. 27	4	70	120	28	5	102	1	53	6	45	179	290	316	13	28	23	8	47	26	250	186	264	75
Nov. 28	168	39	57	40	205	189	3	103	156	44	206	290	305	175	36	196	71	124	181	82	186	315	1,493
Nov. 29	25	75	158	44	14	38	0	57	8	37	80	266	277	22	47	27	14	54	50	38	136	140	100
Nov. 30	160	119	270	76	32	205	5	104	22	249	149	277	284	19	16	38	92	69	35	75	94	269	310
Dec. 1	183	204	199	77	116	65	9	179	106	68	85	199	177	140	90	156	141	42	189	100	245	221	1,095
Dec. 2	268	235	127	138	224	228	0	290	137	261	46	250	210	164	84	194	251	256	------	167	201	74	1,267
Mean	**148**	**114**	**146**	**62**	**112**	**133**	**5**	**116**	**89**	**105**	**114**	**262**	**257**	**108**	**72**	**124**	**114**	**92**	**127**	**114**	**186**	**208**	**852**
Departure	**−18**	**−11**	**−34**	**−29**	**−17**	**−76**	**−8**	------	------	**−29**	**−33**	**−13**	**+3**	**−45**	**−17**	**−38**	**−6**	**−18**	**−14**	**−79**	------	------	------

ACCUMULATED DEPARTURES ON DECEMBER 2, 1944

	−5,590	**−1,057**	**−10,378**	------	**−5,347**	**+3,271**	------	------	------	**+4,081**	------	------	------	**−451**	------	**−5,818**	**−1,476**	**+1,768**	**+2,748**	**−2,419**	------	------	------

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR NOVEMBER 1944

By Lucy T. Day

[Equatorial Division, U. S. Naval Observatory]

[Communicated by Commodore J. F. Hellweg, U. S. N. (Ret.) Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count are included assumed longitude of center of the disk, assumed latitude of center of the disk, total areas of spots and groups and total spot count.

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1944	h m		°	°	°	°				
Nov. 1	10 38	7684	−37	224	−6	40	48	15	G	U. S. Naval.
		7684	−35	226	−7	37	12	1		
		7684	−33	228	−7	35	48	5		
				(261)	(+4)		108	21		
2	11 54	7684	−23	224	−6	26	61	10	G	Do.
		7684	−19	228	−6	23	36	2		
		7684	−17	230	−7	22	61	7		
		7684	−12	235	−5	15	48	4		
				(247)	(+4)		206	23		
3	11 40	7684	−9	225	−6	13	36	3	G	Do.
		7684	−5	229	−9	13	12	5		
		7684	−3	231	−7	11	48	4		
		7684	+1	235	−5	9	6	1		
				(234)	(+4)		102	13		
4	11 51	7685	−79	141	+21	79	6	1	G	Do.
		7684	+5	225	−7	12	24	2		
		7684	+11	231	−9	17	24	5		
		7684	+11	231	−6	15	12	2		
		7684	+16	236	−5	18	16	1		
				(220)	(+4)		82	11		
5	11 23	7685	−67	140	+21	67	6	1	F	Do.
				(207)	(+4)		6	1		
6	10 43	7685	−52	143	+21	53	12	2	G	Mt. Wilson.
				(195)	(+4)		12	2		
7	14 28			No spots						Do.†
8	11 25			No spots						Do.†
9	10 52			No spots						Do.†
10	11 38	(*)	−53	88	−5	54	24	3	F	U. S. Naval.
				(141)	(+3)		24	3		
11	9 56	7686	−48	81	−16	52	61	2	F	Do.
				(129)	(+3)		61	2		
12	11 5	7687	−77	38	−26	78	36	1	F	Do.
		7686	−35	80	−17	40	12	1		
		7686	−33	82	−17	39	6	2		
				(115)	(+3)		54	4		
13	11 17	7687	−62	40	−26	67	24	1	F	Do.
		7686	−21	81	−17	28	6	1		
				(102)	(+3)		30	2		
14	10 40	7687	−48	41	−25	54	12	1	F	Do.
				(89)	(+3)		12	1		
15	11 36	7688	−87	349	+21	87	388	1	G	Do.
		7687	−35	41	−23	42	24	3		
				(76)	(+3)		412	4		
16	12 38	7688	−72	350	+21	72	388	1	G	Do.
				(62)	(+3)		388	1		
17	12 21	7688	−59	350	+21	60	388	1	F	Mt. Wilson.
				(49)	(+3)		388	1		
18	11 44	7688	−50	346	+21	53	24	8	G	U. S. Naval.
		7688	−46	350	+21	48	388	1		
				(36)	(+2)		412	9		
19	11 31	7688	−36	347	+22	40	36	5	F	Mt. Wilson.
		7688	−32	351	+21	36	436	1		
				(23)	(+2)		472	6		
20	11 31	7688	−19	351	+21	27	436	1	G	Do.
				(10)	(+2)		436	1		
21	10 39	7688	−6	351	+21	20	436	1	F	U. S. Naval.

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR NOVEMBER 1944—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1944	h m		°	°	°	°				
				(357)	(+2)		436	1		
Nov. 22	10 26	7689	−27	317	−19	33	24	1	F	U. S. Naval.
		7689	−24	320	−19	32	24	4		
		7688	+4	348	+24	23	6	3		
		7688	+8	352	+21	21	436	1		
				(344)	(+2)		490	9		
23	10 55	7689	−16	314	−21	27	12	2	F	Do.
		7689	−12	318	−20	25	24	1		
		7689	−8	322	−20	22	24	1		
		7688	+20	350	+21	28	436	1		
				(330)	(+2)		496	5		
24	10 54	7689	−2	315	−21	23	36	7	G	Do.
		7689	+1	318	−20	22	61	10		
		7688	+33	350	+21	36	461	1		
				(317)	(+2)		558	18		
25	10 35	7689	+12	316	−22	27	48	4	F	Do.
		7689	+15	319	−21	28	24	1		
		7688	+46	350	+20	48	436	1		
				(304)	(+2)		508	6		
26	12 52	7688	+60	350	+20	61	412	1	F	Do.
				(290)	(+1)		412	1		
27	11 35	7690	−12	265	+19	20	6	1	G	Mt. Wilson.
		7690	−9	268	+19	19	36	6		
		7688	+74	351	+20	75	388	1		
				(277)	(+1)		430	8		
28	10 37	7690	0	265	+17	16	8	3	F	U. S. Naval.
		7690	+3	268	+21	20	6	3		
		7690	+5	270	+19	18	24	2		
		7688	+84	349	+20	84	388	1		
				(265)	(+1)		426	9		
29	10 53	7690	+14	265	+19	22	12	2	G	Mt. Wilson.
		7690	+17	268	+19	23	24	10		
				(251)	(+1)		36	12		
30	10 32	7691	−20	218	−8	22	12	6	F	U. S. Naval.
		7690	+27	265	+17	32	6	1		
				(238)	(+1)		18	7		

Mean daily area for 30 days = 234

† Data from Mount Wilson charts.
(*) Not numbered.

VG = very good; G = good; F = fair; P = poor.

PROVISIONAL RELATIVE SUNSPOT NUMBERS FOR SEPTEMBER 1944

[Based on observations at Zurich except as indicated by an asterisk. Data furnished through the courtesy of Prof. W. Brunner, Swiss Federal Observatory, Zurich, Switzerland]

September 1944	Relative numbers	September 1944	Relative numbers	September 1944	Relative numbers
1	0	11	14	21	21
2	*Wc* 21	12	22	22	22
3	8	13	25	23	20
4	8	14	* 22	24	*a* 23
5	0	15	*a* 20	25	* 23
6	0	16	14	26	21
7	0	17	12	27	18
8	0	18	12	28	11
9	**d* 9	19	14	29	9
10	11	20	*Ec* 20	30	*Mc* 28

Mean, 30 days = 14.3

*= Observed at Locarno.
a = Passage of an average sized group through the central meridian.
b = Passage of a large group through the central meridian.
c = New formation of a group developing into a middle sized or large center of activity; E, on the eastern part of the Sun's disc; W, on the western part; M, in the central circle zone.
d = Entrance of a large or average sized center of activity on the east limb.

Chart I. Hurricane of October 13-21, 1944

Chart I. Hurricane of October 13-21, 1944

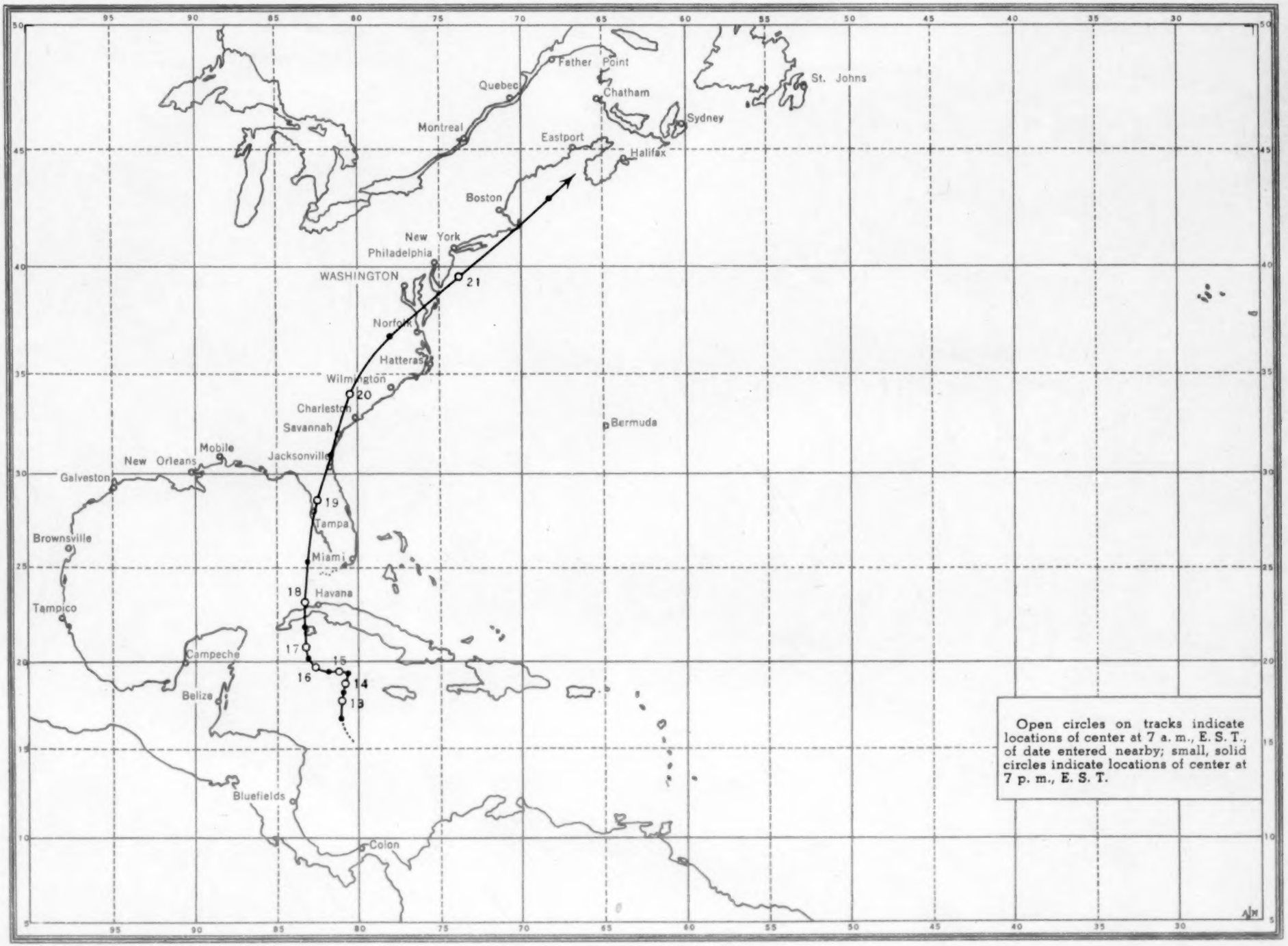


Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, November 1944

Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, November 1944

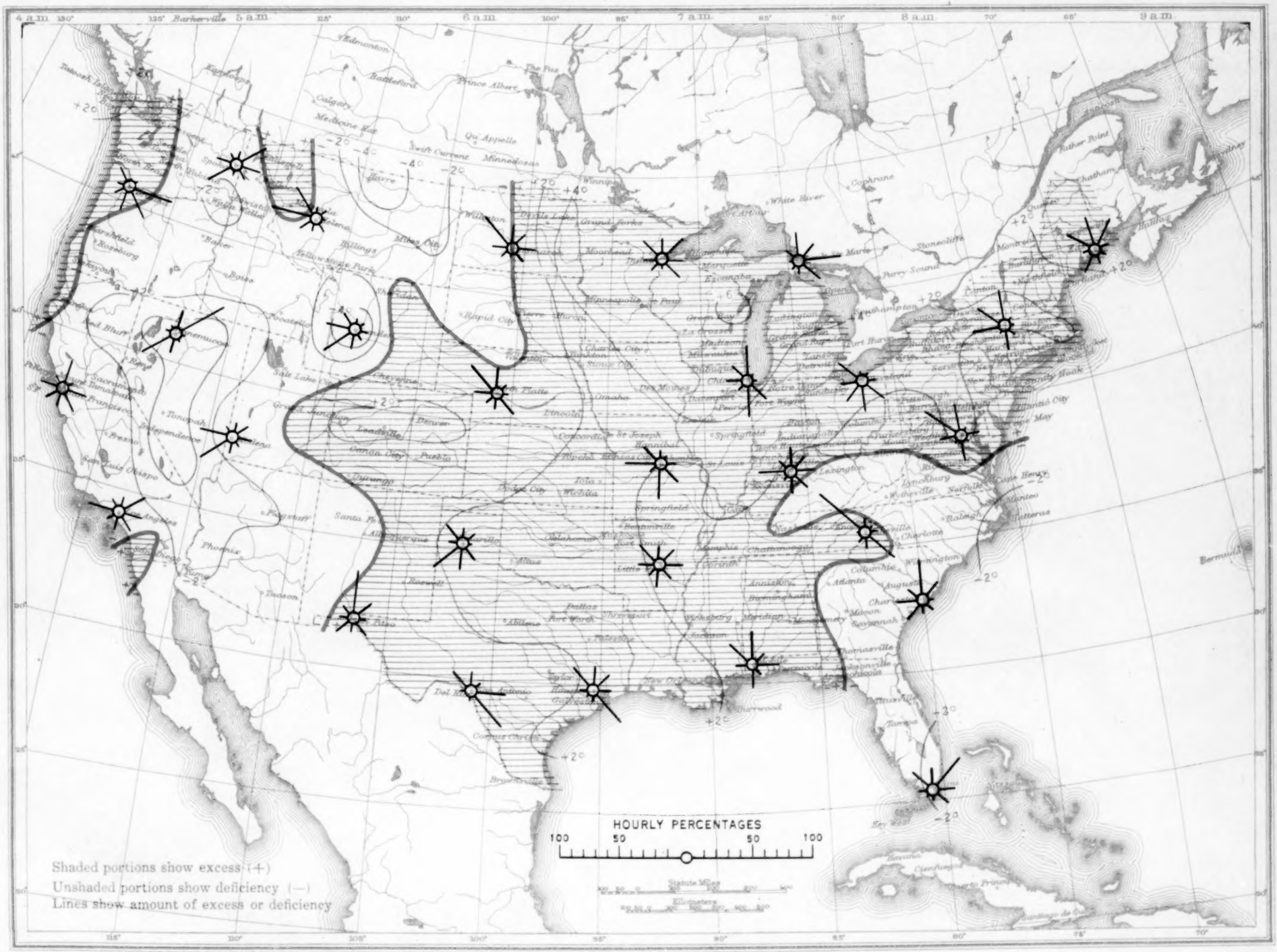
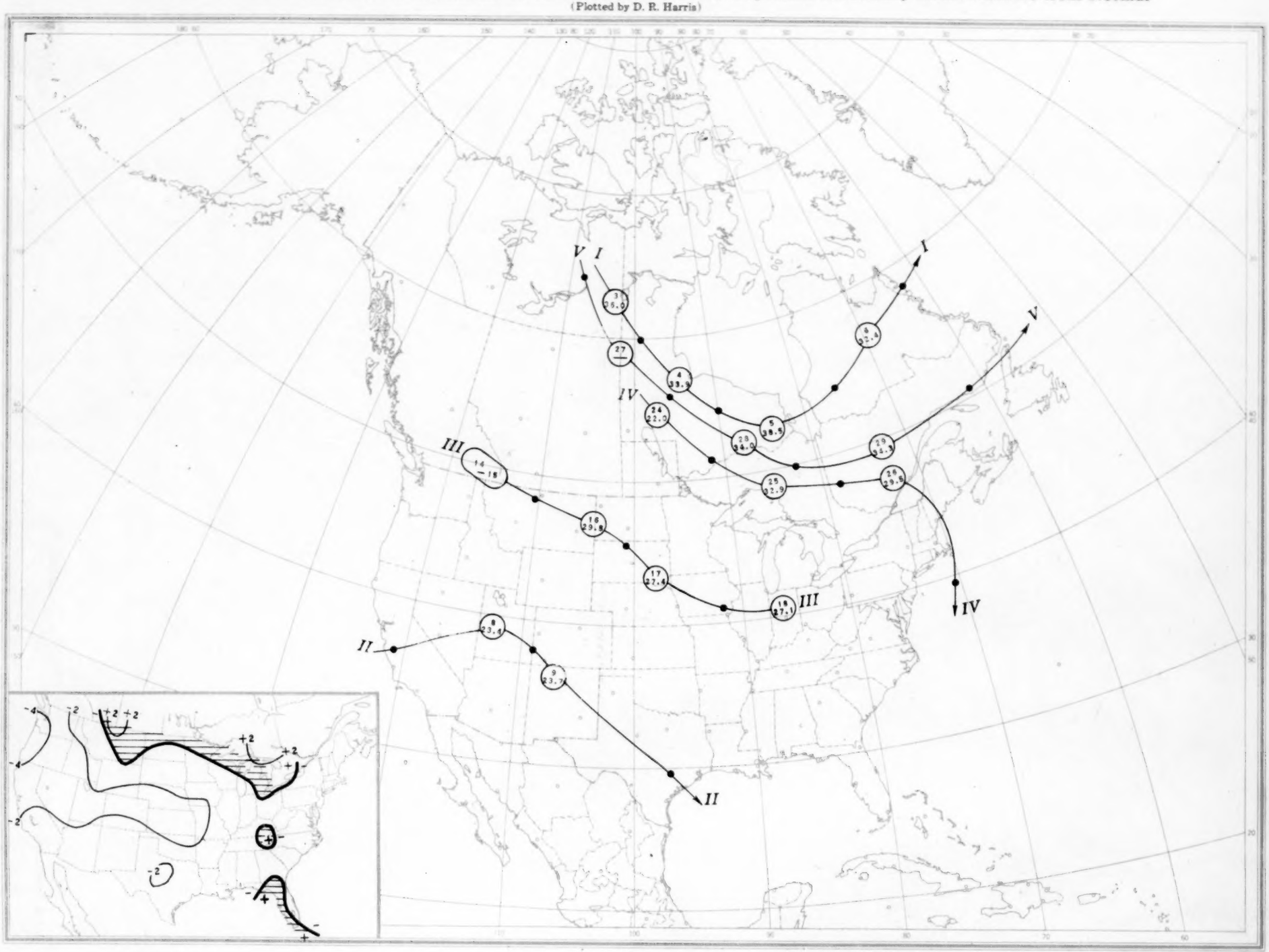


Chart II. Tracks of Centers of Anticyclones, November 1944. (Inset) Departure of Monthly Mean Pressure from Normal

(Plotted by D. R. Harris)



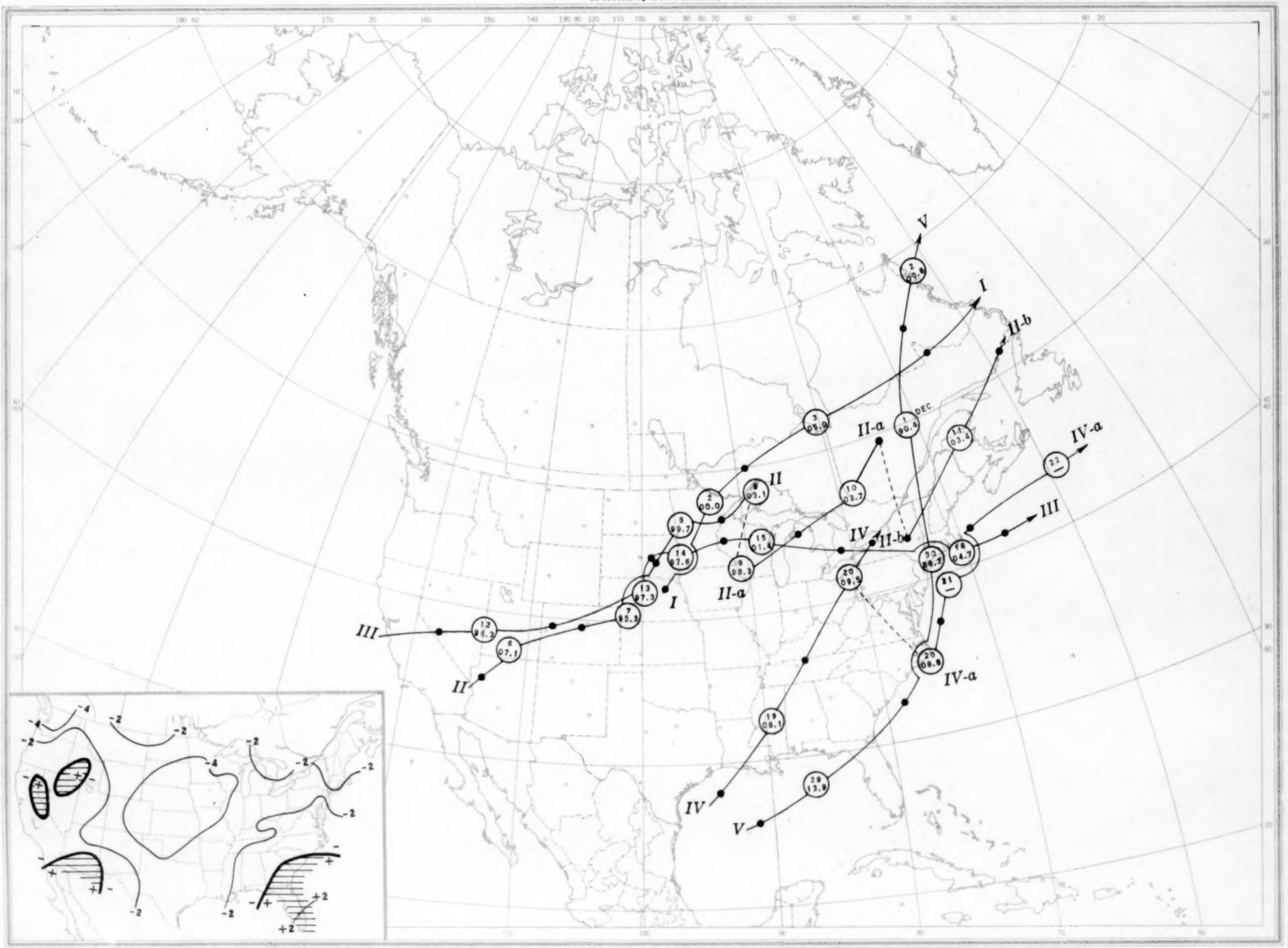
Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (75th meridian time)

Chart III. Tracks of Centers of Cyclones, November 1944. (Inset) Change in Mean Pressure from Preceding Month

Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (75th meridian time)

Chart III. Tracks of Centers of Cyclones, November 1944. (Inset) Change in Mean Pressure from Preceding Month

(Plotted by D. R. Harris)



Circle indicates position of cyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 7:30 p. m. (75th meridian time)

Chart IV. Percentage of Clear Sky Between Sunrise and Sunset, November 1944

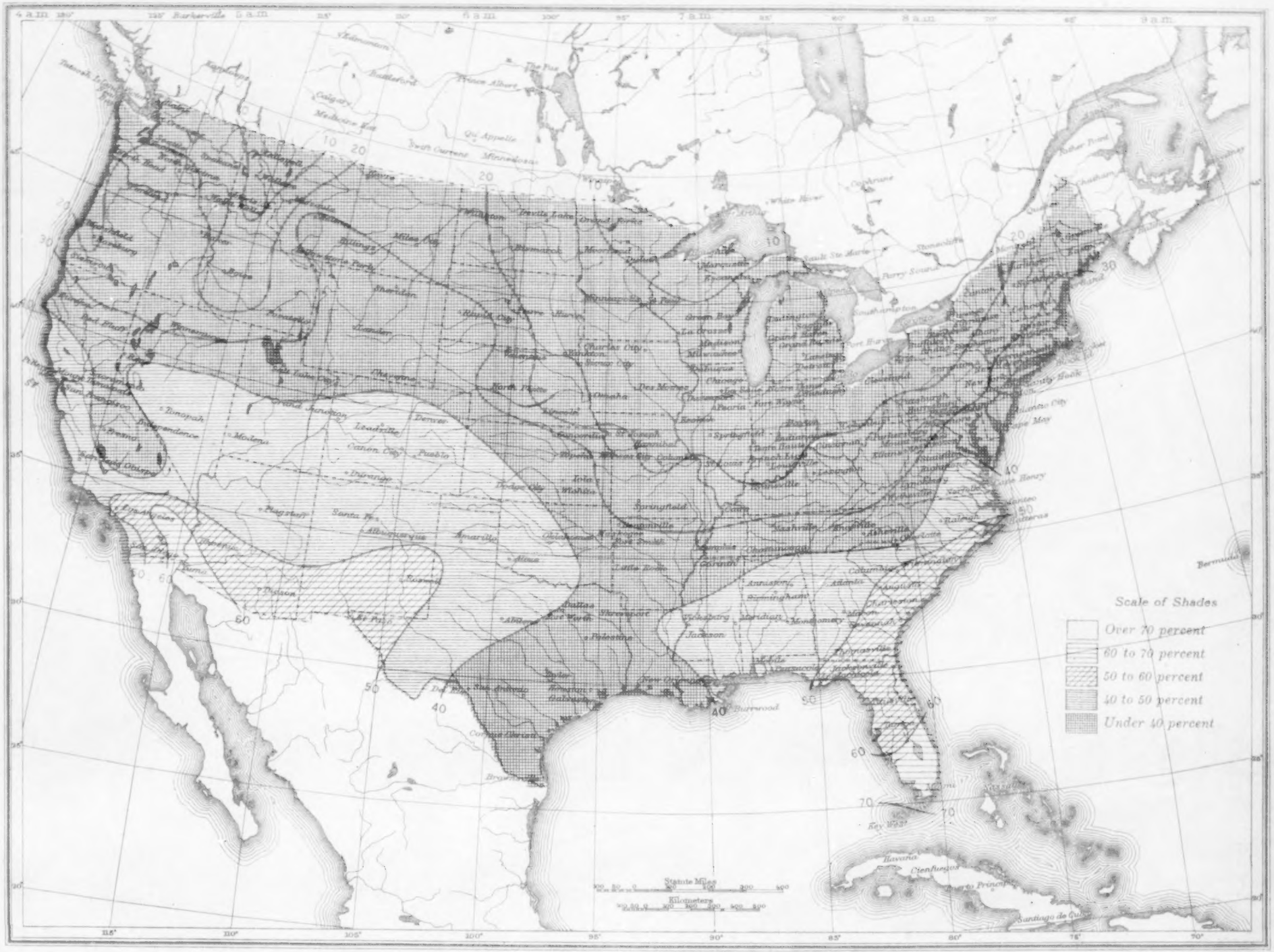


Chart V. Total Precipit..tion, Inches, November 1944. (Inset) Departure of Precipitation from Normal

Chart V. Total Precipitation, Inches, November 1944. (Inset) Departure of Precipitation from Normal

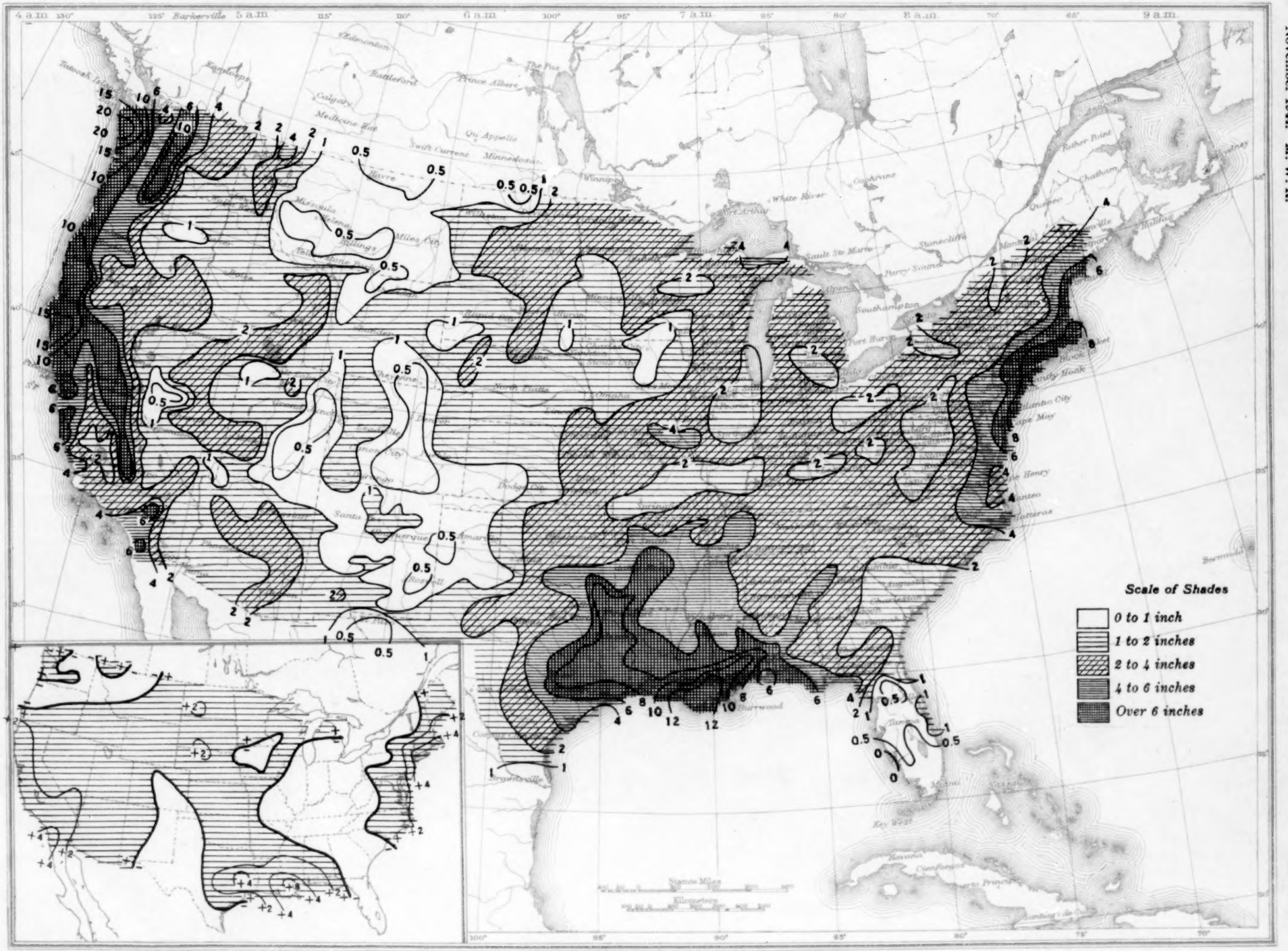


Chart VI. Isobars(mb), at Sea Level and Isotherms °F at Surface; Prevailing Winds, November 1944

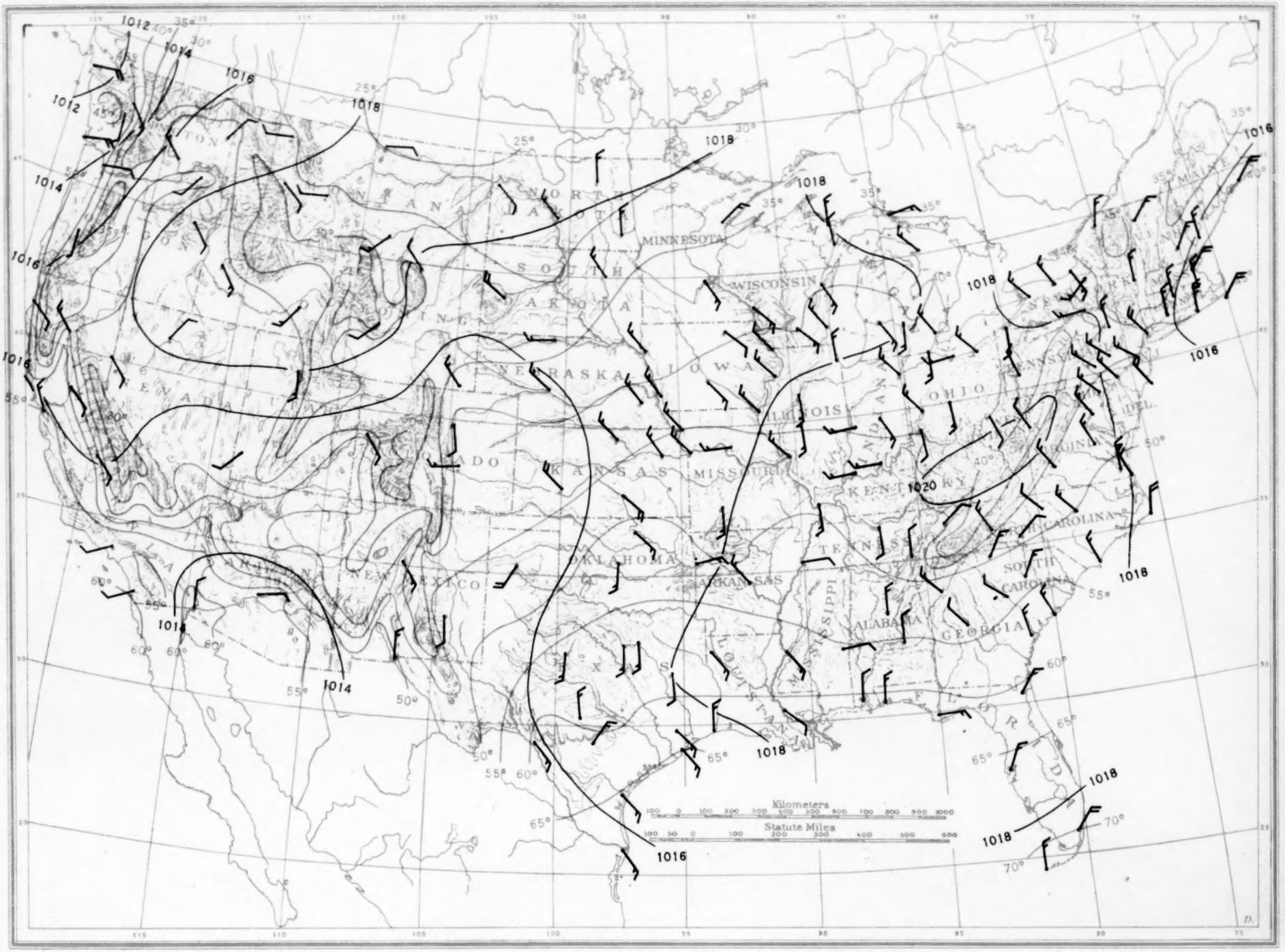


Chart VII. Total Snowfall, Inches, November 1944

Chart VII. Total Snowfall, Inches, November 1944

Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.), and Isotherms (°C.), and Resultant Winds for 1,500 Meters (m. s. l.) November 1944

Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.), and Isotherms (°C.), and Resultant Winds for 1,500 Meters (m. s. l.) November 1944

Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

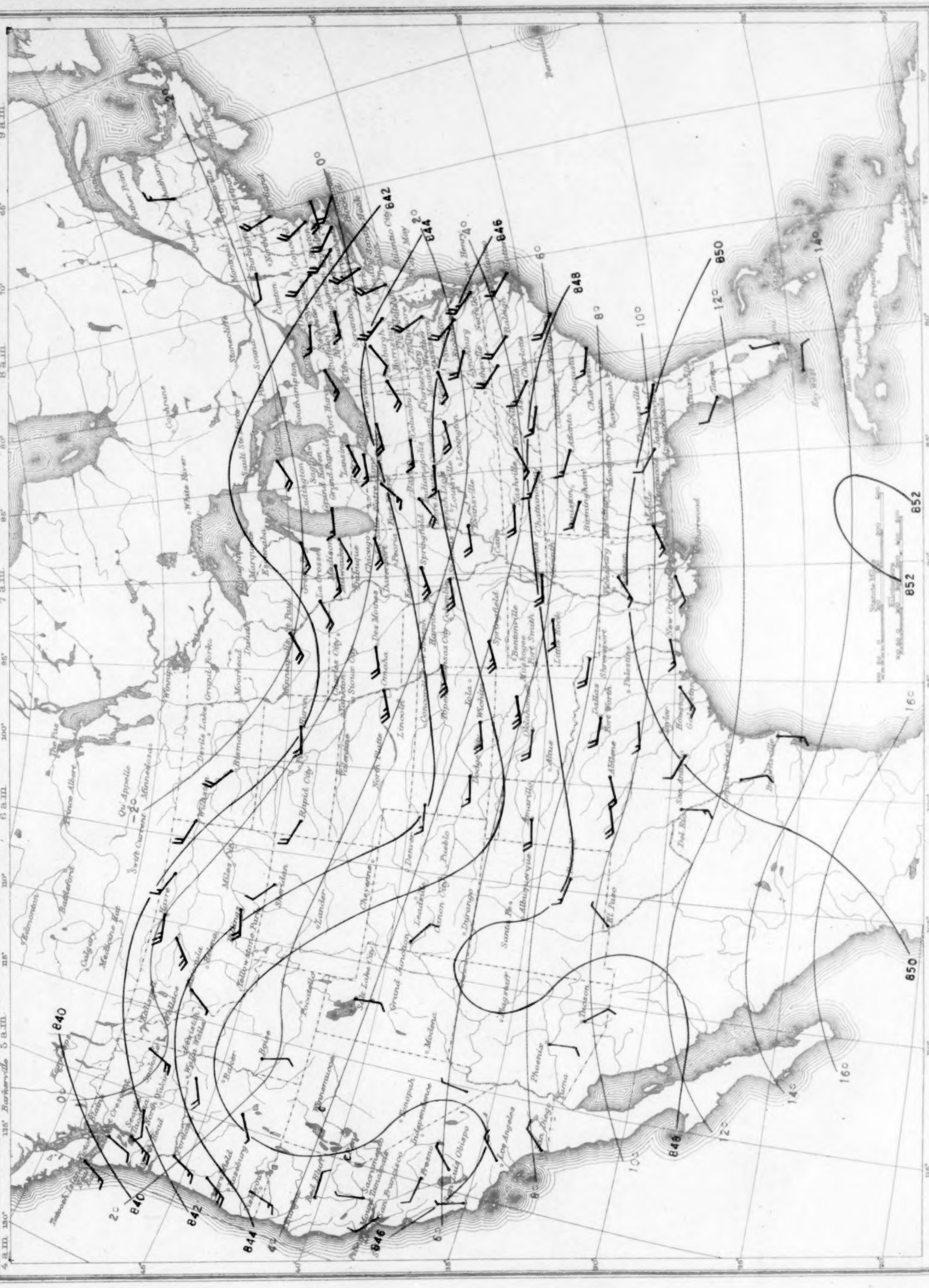


Chart IX. Isobars (mb), Isotherms (°C.), and Resultant Winds for 3,000 Meters (m. s. l.) November 1944

Isobars and isotherms based on radiosonde observations 11:00 p. m. at (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.)

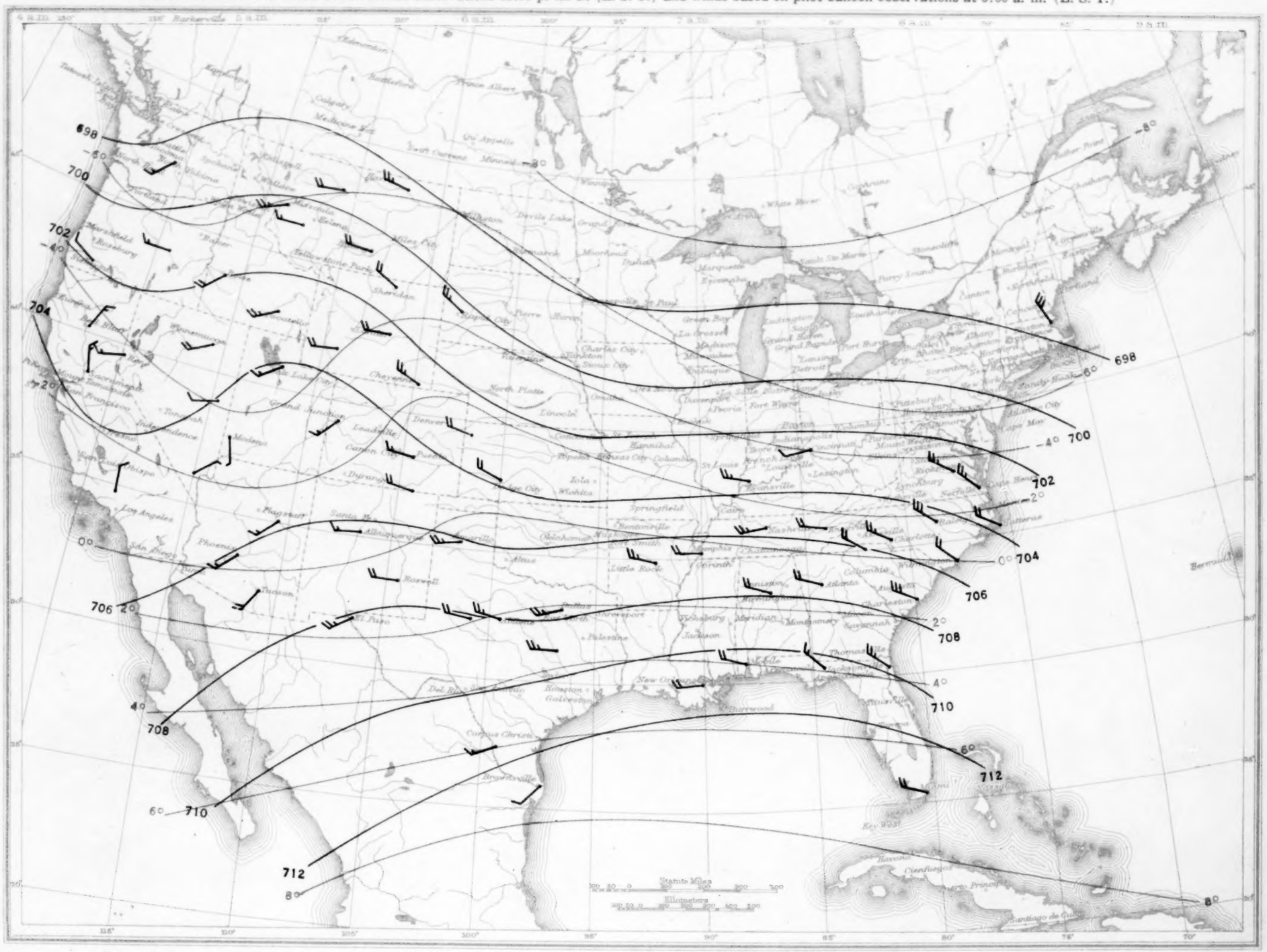


Chart X. Isobars (mb), Isotherms (°C.), and Resultant Winds for 5,000 Meters (m. s. l.) November 1944

Chart X. Isobars (mb), Isotherms (°C.), and Resultant Winds for 5,000 Meters (m. s. l.) November 1944

Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).

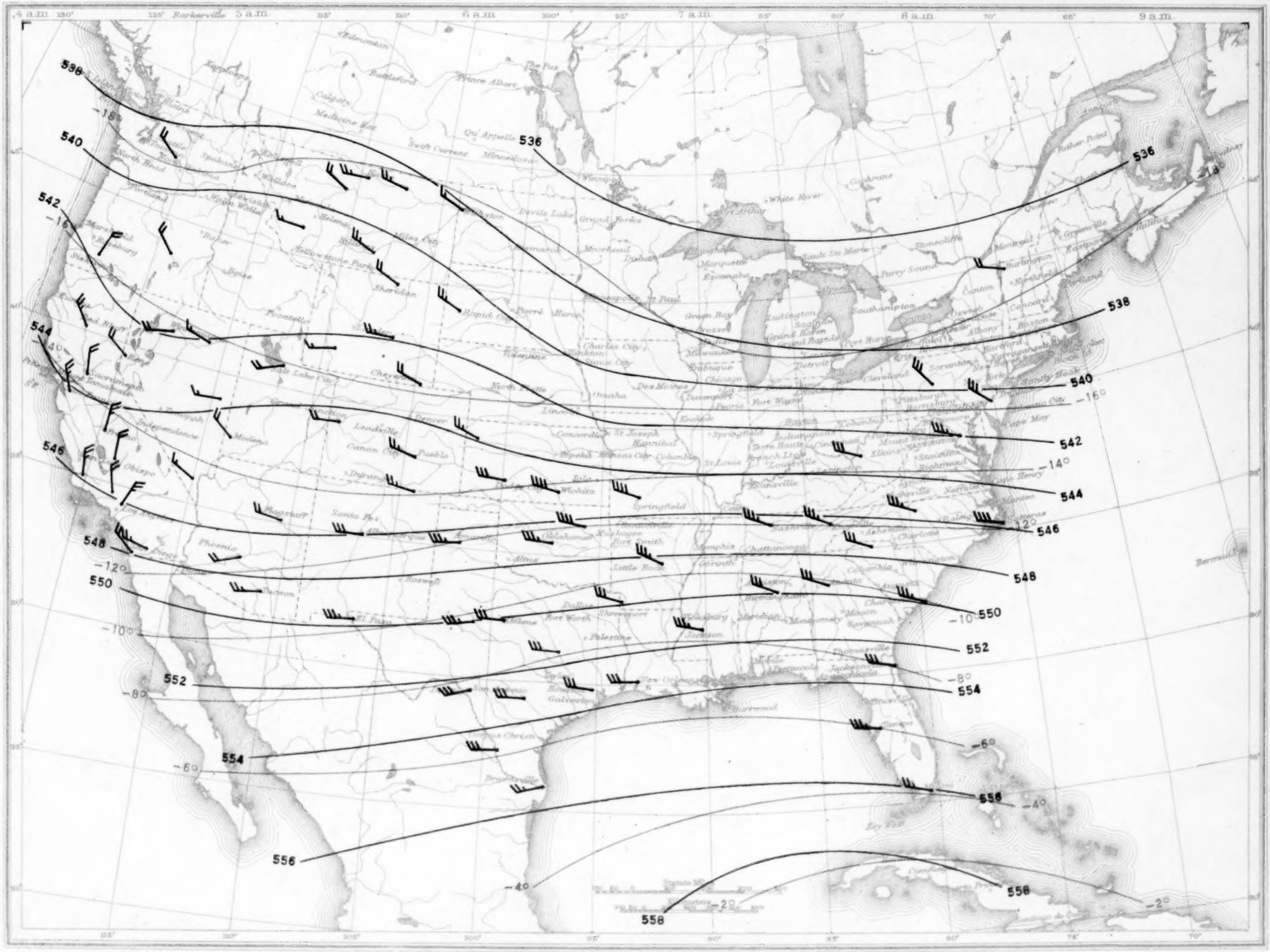


Chart XI. Isobars (mb), Isotherms (°C.), and Resultant Winds for 10,000 Meters (m. s. l.) November 1944

Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).